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AUDIO-VISUAL TECHNIQUES FOR ENRICHMENT OF THE CURRICULUM



AUDIO-VISUAL
TECHNIQUES
For Enrichment of
the Curriculum

by
ANNA CURTIS CHANDLER, Ed. D.
and
IRENE F. CYPHER, Ph. D.

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INTRODUCTION

THIS BOOK is a real contribution to modern education, both in its theory, and in its practice.

The authors' conception of audio-visual enrichment is not a narrow-minded attitude, but "entails a grasp of the inter-relationship of various areas in the curriculum and the careful selection of these aids which are so potent in enriching them."

This broad meaning of audio-visual enrichment does not restrict itself to elementary and secondary schools, but it is also good for pre-school education as well as for adult education beyond secondary institutions, regardless of the curriculum. As the authors say, "Audio-visual enrichment means the realization that one area cannot be taught alone, that this integration and enrichment must cause the learning experience to become vital, human, sensory, through related areas."

All these areas will appeal to children, youths, and adults on the basis which Dr. Thomas M. Balliet (former Dean of the N.Y.U. School of Pedagogy) called sensory-motor training, illustrating the well-known principle that all impressions (stimuli) strive for expressions (doings), and lead to reflective and creative thinking.

According to the authors, the term "audio-visual aids" includes not only the motion picture and the lantern slide, but a rich store of all materials for educational stimuli from A to Z, such as anaglyphs, aquaria, blackboard-chalk, bulletin

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boards, cartoons, charts, clubs, comics, costumes, creative achievements, dancing, dioramas, demonstrations, discussions, dolls, dramatics, field trips, filmstrips or filmslides, flat pictures, furniture, graphs, illustrated talks, kodachrome slides, live animals and plants, maps, miniature stage-sets, modeled figures, murals, nature specimens, objects, photographs, pictures (plain and colored), radio, relics, sandbox scenes, school "movies," stamps, stereographs, story-telling, tableaux, television, terraria, vectographs, and visits to the zoo!

Our authors claim that children from their first birth to their "second birth" (at the age of 14 years), youths from 14 to 21 years, and adults from 21 years up should be trained and educated *as a whole* by means of all available audio-visual and other sensory-motor aids, designated for the simultaneous development of hand, heart and head; and all leading to a wise world in the near or distant future, since "a nation without vision must perish," to use the Biblical expression.

In other words, the authors are trying by their multiferous audio-visual aids to avoid that education which was narrow and one-sided, exercising and developing certain abilities and human attributes at the expense of the rest. The avowed aim of the writers of this book is to point the way to the best possible means of education for World Citizenship.

The practical side of this book is still more interesting, and its merits include almost all the good hints offered by great educators to help the students learn their lessons more

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economically and efficiently, beginning with Comenius' *Orbis Pictus* up to the most recent book on visual aids published today.

This book is full of practical examples of the uses of specific aids, and advice on where to obtain help in acquiring audio-visual materials, plus a careful and useful glossary. The authors offer, also, six practical points to bear in mind in selecting and using audio-visual aids; fourteen values of audio-visual aids when effectively used in teaching; and five dangers to avoid in using audio-visual aids.

This book should be in the hands not only of good teachers in all grades from kindergarten to university, but also should be consulted by all others who are interested in helping to develop a modern, ideal and useful American culture and civilization.

Paul R. Radosavljevic,
Professor Emeritus of Experimental Education,
New York University School of Education

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1. Audio-Visual Enrichment



VISUAL AIDS and audio-visual aids are familiar terms in the realm of education. For some years they have been widely used, enthusiastically discussed and evaluated. Long before World War II these aids were used by museums in integrated programs. They early recognized the educational possibilities of flat pictures, slides, stereographs, motion pictures and dioramas as incentives to the understanding and enjoyment of "realia"—their gallery treasures. Schools recognized their value, also, but in 1936 only four percent were equipped with projectors, and four years later, in 1940, not more than ten percent. Although in recent years the appropriation for "visual instruction" in schools has, in many cities, been increased, more funds are needed for proper school use of these aids.

A great impetus in the use of these teaching tools came through their extensive and intensive use in World War II for speedy and effective training of men and women in both military and industrial skills. With the war over, many used projectors were sold at reduced prices. Many films prepared by our Government became available. More schools are able to use this significant method of teaching. With our naval, military, and industrial centers realizing the potency of this teaching method, our educators will understand more than ever before how necessary these aids are in the education of our boys and girls in democracy and world-understanding. They will realize, also, how necessary these audio-visual

AUDIO-VISUAL ENRICHMENT

aids are in the integration of the various areas of the curriculum—Social Studies, Language Arts, the Sciences, Art, Music, and Dramatics.

Long ago educators realized the value of visual enrichment, not as a separate subject, or a teaching project, but as an effective, vital, teaching method, providing for the presentation of knowledge through the seeing experience. Audio-visual enrichment is not entertainment, but a vital part of the curriculum.

Today, with the sound motion picture, the radio, and the recordings which now accompany many of the filmstrips, the hearing experience combines with the seeing, and audio-visual impressions result in still more meaningful teaching and functional learning. Other senses are also important in learning, especially that of touch, the sense earliest aroused. In some learning situations the sense of smell and that of taste are effective, also. So, we may speak of certain combinations of these aids as multi-sensory rather than audio-visual aids. These are especially meaningful to young children.

What are these aids which contribute to happy and effective learning through the enrichment and integration of the various areas in the curriculum? Which present knowledge through the eyes and the ears? They include charts, maps, books, flat pictures, slides, filmstrips, motion pictures, radio, television, stereographs, models, dioramas, realia, recordings, phonograph records, lectures, story-hours, demonstrations, tableaux and dramatics.

SELECTION AND COMBINATION OF AIDS. The mere showing of these aids does not mean effective audio-visual enrichment. That entails a grasp of the interrelationship of various areas in the curriculum and careful and intelligent selection of these aids which are so potent in enriching them. Audio-visual enrichment means the realization that one area cannot be taught alone, that this integration and enrichment must cause the learning experience to become vital, human, sensory, through related areas. The challenge for more care and deeper understanding in the selection of these aids, for quality, authenticity and vividness of appeal, is increasing with the greater demands for this effective method which produces more learning in less time—and happy learning.

Not only quality, authenticity, fitness and vividness of appeal in relation to the content of the curriculum area or areas are important in the selection of these aids, but an understanding of their relative advantages in different teaching situations. This relative advantage of each aid and of combinations of aids must be considered in connection with each teaching and learning situation.

The teacher herself, and under her guidance, the teacher-in-training or pupil, should understand how to evaluate the authenticity, quality and relationship of these concrete teaching aids, and the advantage of each type or combination. She may feel that appeal to the eye is sufficient in a given learning situation or she may decide that appeal

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to the ear is also needed for the best presentation of her subject matter. Again, after careful evaluation of the various aids available, she may be convinced that three-dimensional objects, models and dioramas, or three-dimensional pictures—stereographs—will make a more concrete and realistic impression upon the children since they stimulate the sense of touch which is strong in everyone, especially in children. Today, polaroid filters make it possible to project three-dimensional pictures in color. These three-dimensional visual aids enable boys and girls to feel more completely the reality of the experience and actually to participate in it. Or, she may feel that the projection of slides combined with the motion picture will make the learning situation more vital. In each case, the choice of audio-visual aids must be suited to the purpose of the lesson.

HAPPY LEARNING IN RELATED AREAS. Since effective learning is secured only through effective teaching, that method or those methods of teaching should be used which bring to the child most effectively and economically the desired results. An important outcome is a joyous attitude towards learning as well as the ability to experience the content in learning with resultant experiences which help him develop into a happy, active individual, able to live with himself and with society. Audio-visual enrichment of the curriculum as a teaching method stimulates thinking,

LEARNING IN RELATED AREAS

quickness creative imagination, helps the child become oriented to the material which is presented to him. It calls forth spontaneous, enthusiastic and creative responses from boys and girls who are eager to see, to hear, to touch, to experience, who have great capacity for wonder and discovery, and for free and joyous expression. Integrated, enriched programs made possible by audio-visual aids, change the curriculum from stereotyped, formal, verbal learning in unrelated areas to vital and happy learning in related areas with provision for

A student-teacher showing color prints to children—a visual experience stimulating an appreciation of art and creative expression.



AUDIO-VISUAL ENRICHMENT

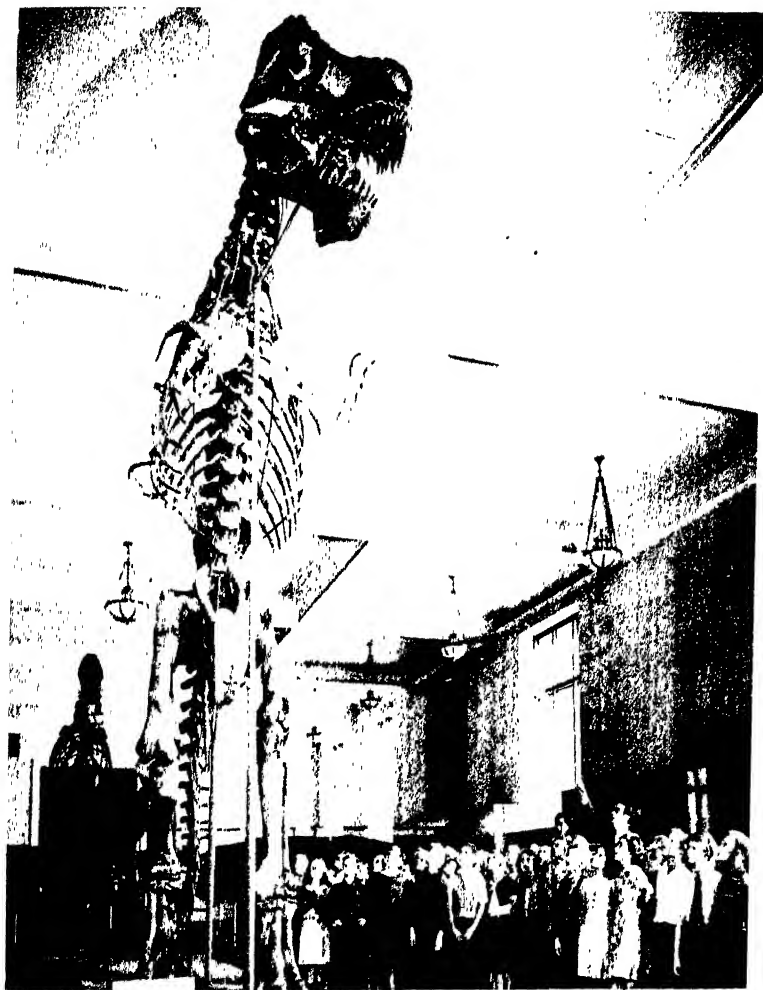
individual thinking, feeling and doing in life-like situations and dynamic experiences.

Audio-visual aids, like art, music, dramatics and the dance, are a common language, a common denominator among all people. They help develop and increase personal understanding and appreciation of the areas of learning which they humanize and enrich. They develop a better understanding of their relationship and of the interrelationship of all countries in the world today.

Technical advance in the production of audio-visual aids has been great, fine equipment is ready, information for its use is at hand. The specific challenge is the school budget. How ideal the situation would be if each school might have sufficient appropriation for an audio-visual room with adequate equipment, and a teacher trained in the selection and use of these aids, who would be in charge of this work without the burden of other teaching duties. For the success of this enrichment depends largely upon an understanding of what to use and how and when to use it. Such a person would control and direct the successful distribution of these aids in the various classrooms at the time they are needed, for only thus can they be effective in making the various areas vital and meaningful.

There are educational, governmental, and commercial sources, where a helping hand is available in the selecting of these aids. Much material for school use can be procured at no expense; much at special rates. For many children trips to

LEARNING IN
RELATED AREAS



Museums contain many awe-inspiring evidences of life long ago, such as this huge skeleton of a carnivorous dinosaur.

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museums and libraries, historical monuments, factories, botanical gardens, shops, or dairies, with their original material in proper settings, make it possible for the learning situation to be the real experience.

WHAT TO KEEP IN MIND

I. VALUE OF AUDIO-VISUAL AIDS—WHEN EFFECTIVELY USED IN TEACHING

1. Lessen major weakness of verbalism.
2. Humanize and vitalize subject matter.
3. Provide interesting approach to new topics and give correct initial impression.
4. Provide happy learning.
5. Economize time in learning.
6. Increase ability of retention.
7. Aid in developing keen observation.
8. Supply concrete material needed.
9. Stimulate initiative of pupils in making materials.
10. Stimulate creative responses in pupils.
11. Provide the best substitute for real experience.
12. Stimulate interest and aid in self-expression.
13. Enrich and clarify instruction.
14. Help in orienting the child to the world in which he lives.

II. POINTS TO BEAR IN MIND WHEN SELECTING AND USING AUDIO-VISUAL AIDS

1. Audio-visual teaching aids must have some direct relation to lesson (they must not be mere entertainment).
2. Audio-visual aids should be so selected as to supplement and enrich various areas in the curriculum.
3. Audio-visual aids should be adapted to grade level.
4. Audio-visual aids should be selected, combined and used in a way which will be most effective for a particular lesson.
5. Audio-visual aids are not a separate subject but a vital teaching method.
6. Preview all types of audio-visual materials before using in class.

III. DANGERS TO AVOID IN USE OF AUDIO-VISUAL AIDS

1. Material unsuited to a particular teaching situation.
2. Too much material used at one time.
3. Use of materials poor in quality.
4. Use of materials unsuited to child's mental level.
5. Failure to integrate the various aids to the teaching situation or to the curriculum.

II. Aids in War and Peace



DURING WORLD WAR II, audio-visual aids, or, as they were called in the armed forces, "Training Aids," were vital in effective and speedy training of men and women in military and industrial knowledges and skills. Never before did a war require so much learning and training—training of soldiers, sailors, aviators, marines, WACS, WAVES, SPARS and workers in industrial units. These aids saved time in our training camps, producing the desired results in the most effective and economical way. Pictures of war activities and techniques could be shown to classes of all sizes, providing the equipment and room facilities were adequate, so that all might see and hear to the best advantage.

Many sound motion pictures, filmstrips, both silent and with recordings, glass and kodachrome slides, stereographs, charts, maps, posters, photographs, models—both solid, cutaway, and with movable parts—were prepared by experts for our Government. These proved an outstanding success in the rapid and successful training of men in the armed forces and civilian war-workers.

These Training Aids were helpful in orientation, in better understanding of the causes of the war, in the realization of the close relationship of civilian war-workers to those in the armed forces. They helped ground, sea, and air troops understand the terrain of various combat areas. They were vital in teaching how to give first aid to sick and wounded comrades. They swiftly and effectively trained the men to

AIDS IN WAR AND PEACE

recognize instantly enemy aircraft and taught skills in operating complicated machinery. They built up morale by inspiring confidence in ability to "carry on" in various combat areas. In addition, they were indispensable in training personnel for mass production, since they enabled the trainees to feel a realistic and actual participation.

AUDIO-VISUAL AIDS IN PEACE. Teachers will readily appreciate that these training aids and audio-visual techniques, which were so effective in wartime, are equally effective in peacetime education.

Today we are discussing peace in world terms. Time and distance, the greatest barriers to an understanding of various peoples, can be bridged by this effective method. Like a magic carpet, audio-visual aids can take our boys and girls to remote corners of the earth—or bring the world to the classroom. They can make possible a visit to the very homes of our near and far neighbors, and cover more ground in a shorter period of time than can be traversed by any other kind of transportation, even our swiftest airplanes. The better our boys and girls, for whose happiness in the world of tomorrow hosts of soldiers have fought and died, understand the people of other countries, their culture and ideals, the more likely it is that they will be able to live together in peace.

PROMOTE WORLD UNITY. Visual, audio, and audio-visual programs whether on the air, or in classrooms and auditoriums, will no longer be called the "Americana Series,"

PROMOTE WORLD
UNITY

fostering Americanism alone, but rather "The World of Today Series," furthering world unity. Ideals of democracy, knowledge of, and pride in, the builders of our democracy and their achievements both yesterday and today will be presented to our boys and girls, in connection with ideals and

A bulletin board can be used effectively to display graphically the common interests of diverse nations, and the blending of these into one world.



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achievements of other countries and their leaders. The importance of common languages, similar interests, desires and goals cannot be overemphasized. Audio-visual aids will help bring full realization of the fact that we are all human individuals belonging to one world, preparing for a lasting peace.

THERAPEUTIC VALUE. These “common denominators”—art, music, the dance, dramatics, audio-visual aids—have another important function in peacetime education. They have a therapeutic value which must not be underestimated or neglected. Programs enriched by audio-visual aids will help relieve the tension of the troubled days so recently over, providing a healing power. We all know the potency of music in healing, arousing and inspiring; the power of color to help the mentally ill; of pictures to bring mental relaxation, comfort and inspiration. We are convinced in school education, as in the education of the armed forces, that audio-visual aids induce greater interest, and happier, more effective learning and longer remembering in less time.

Universal adoption of this effective and happy way of teaching and learning, already used before and during the war in many of our educational institutions and widely developed by educational specialists in many branches of the armed forces, will make our schools dynamic centers of community life, will orient our boys and girls for world citizenship. If these learning and training tools have been so potent in bringing victory to the world, they will be equally effective in ban-

ishing the ignorance, misunderstanding, greed, and hate which hinder a universal peace. Boards of education, associations of parent teachers, mothers' clubs, museums, libraries, religious, governmental and commercial organizations will recognize this, and be generous in their assistance with funds, gifts and loans for the schools.

III. Typical Classroom Aids



IT IS UNFORTUNATE that to many the term "visual or audio-visual aids" today still means principally the motion picture and the lantern slide. For a true picture of what constitutes audio-visual aids it would be well to take a census of all the teaching aids and materials which might justifiably be included in this category.

BLACKBOARD AND CHALK. One of the first and oldest of the visual aids, one which is still in use today, is a piece of chalk and a blackboard. This combination is an ever-effective one, and no schoolroom should be without it. There are times when the presentation of any subject can be most effectively achieved by means of a "chalk talk" or blackboard demonstration. Both teacher and student should use this medium, and students should be encouraged to go to the blackboard and illustrate their presentation of lesson assignments by means of writing or drawing on the blackboard.

BULLETIN BOARDS. From blackboard to bulletin board is a natural transition. This board may be a single piece of homosote or heavy cardboard, framed and hung in a classroom, or it may be a large board or series of boards for school corridor, library, study rooms or school museum. Whatever its size, it affords an opportunity to display pictures, charts, maps, notices, specimens, newspaper clippings and all types of materials which it may be desirable to display in the course

TYPICAL CLASS- ROOM AIDS

of school programs. Material displayed on a bulletin board naturally attracts attention. Therefore, great care should be used in selecting items for posting on this board. An attractive arrangement of the items thus posted is also a factor in catching the eye and holding the interest of the observer.

BOOK ILLUSTRATIONS. Illustrated textbooks and books of any nature included in the learning experience of the child should then be examined. If a school program is to be effective, it is highly important that illustrations, particularly those in the textbooks used, be of a high standard. Many an otherwise good text may be totally inadequate to meet students' needs because of poor or badly chosen illustrations. Those entrusted with the adoption of texts should keep this point in mind when selecting textbooks. The school librarian should be consulted in this matter, for her training and experience in the actual utilization of books gives her an insight into what appeals and what has meaning to children. Teachers, supervisors, principals and parents should all insist that the illustrations in books of every type be selected with as great care as the textual matter. It is through illustrations that the reader's attention is focused upon certain facts. Therefore, the pictures which illustrate and elaborate textual content should present a true and meaningful concept. Better illustrations mean better visual education.

FLAT PICTURES. No matter how well illustrated the textbook in use may be, every teacher finds it helpful to have

additional pictorial material on hand to enrich a lesson. Beautiful color reproductions of works of art, peoples and costumes of other lands, famous places in other parts of the world, all help to make the world around him live for the student. Good reproductions in black and white are also extra aids to the enrichment and vitalization of lessons.

The question as to whether black and white pictures or colored pictures are to be preferred, is practically impossible to answer positively and finally. In general, it might be said that colored pictures present objects and things as they are and, therefore, give a truer likeness. This is true if the color process by which the picture is made is satisfactory, and the color tones are faithful to the original. If the colors are not true to life, it might be better to have good black and white reproductions. In scientific and technical illustrations and diagrams it is often better to have black and white pictures, for details and lines are more distinctly and clearly shown.

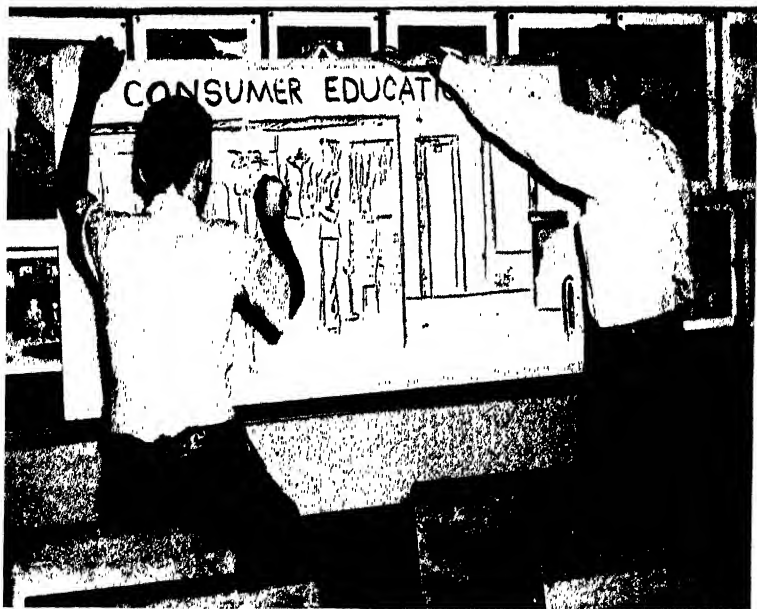
A good collection of flat pictures should be available to every teacher. It is a good practice to have a general reference collection for the school, one on which each teacher may draw, and also for each teacher to have a special collection of her own, particularly pertinent to her own subject or class needs. The school collection may contain pictures of both general and specific nature, collections of reproductions of masterpieces, and special posters and prints. The class collection may be made up of pictures from magazines and newspapers, art work of students, photographs, posters, postal cards, advertis-

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ing brochures, etc. These pictures should all be mounted, or kept in cellophane or manila envelopes for protection. They should also be filed so that they are accessible when needed.

CARTOONS AND COMICS. The cartoon is a unique pictorial medium which has long had a visual appeal and which has assumed even greater importance in the last few years. If a cartoon is well-drawn, the work of a clever artist who can graphically tell his story in picture form, it is a visual

Students find pleasure and profit in preparing their own cartoons to enliven subjects being studied.



aid which is unique, easily understandable and appealing. The cartoon has had a very potent effect in politics, and students of economics and history realize the power which it can wield. There is a definite place for the cartoon in the list of effective visual aids for classroom use.

When the cartoon is reduced to the level of the slightly ludicrous or is poorly drawn, it loses its effectiveness. Many so-called "comic strips" and books of comics have become exceedingly popular with boys and girls. The appeal of this type of material lies, of course, in the universal attraction which pictures hold for young and old alike. Unfortunately, many of these comics are neither well-drawn nor is the subject matter well-chosen. Those who are responsible for them have had commercial returns in mind rather than educational value. There is no valid reason why this type of pictorial presentation could not be utilized for teaching purposes if more care were given to the production of worthwhile picture stories.

It may be that if less emphasis were placed on the designation "comics," and more on the connotation "cartoon," this pictorial medium would better serve educational purposes. The dictionary definition of cartoon, "a picture especially intended to affect public opinion as to some matter or person," should be one criterion to keep in mind when selecting material of this type. A teacher does not deliberately select poorly drawn or inferior color prints for use in the art class. So with cartoons, careful selection should be the determining factor when including them with other visual aids. If well-drawn

TYPICAL CLASS- ROOM AIDS

and thoughtfully prepared, they may be a vital, pictorial medium for the presentation of many different subjects.

MAPS, GLOBES, CHARTS AND GRAPHS. Today, the world is "map conscious" to a degree never before known to teacher and student. It is vitally important that every teacher have available a good collection of aids to help bring this world of ours clearly within the focus of understanding of her pupils. In order to accomplish this, she should have several types of maps in her collection. No *one* map or type of map is adequate to do the complete work of teaching all the geographic concepts necessary to an understanding of our modern world. The school collection should contain good political maps, physical maps, world maps, special area maps, Mercator projection maps, polar-centered projection maps, old maps and pictorial and cartoon maps. As special needs or problems arise, it should be possible for teacher and student to bring to the classroom the particular type of map which is designed to assist in clarifying this situation. Pictorial and cartoon maps will frequently be found helpful in humanizing geographic concepts.

The same care and judgment should be used in selecting maps as are used in selecting flat pictures. A map is a picture of the world or some portion of the world. The map pictures selected for any lesson should be those best adapted to meet the need of the student at the moment at which they are used. Many teachers prefer using a variety of maps (political map,

MAPS, GLOBES
AND GRAPHS

ancient map, modern map, etc.) so that a complete story may be told. This is very good when the question under consideration involves exploration and changing world frontiers.

The picture conveyed by a map will always be more complete if a globe is used in conjunction with the map. Globes are needed to keep before the student the picture of the world as it is; globes bring the world itself into the classroom for interpretation and consideration. As with maps, there are dif-

Globes and maps, used in conjunction with each other, give students a better understanding of geography.



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ferent types of globes: political, physical, desk model, floor model, etc. It is advisable to have several different types of globes in the school collection.

Charts and graphs are aids which belong in the classification with maps and globes. Charts, particularly those showing time lines and historical sequences, help to visualize historical development. Diagrammatic charts, such as those illustrating the structure of governments or community organization, and picture graphs all aid in bringing before students' eyes a picture of the world and the things upon it.

DIORAMAS. There is available today a visual aid which originated in the museums of the United States and which is only just beginning to be used effectively in the classrooms. It is the diorama. The term "diorama" is derived from the Greek and means "to see through." The diorama itself may be defined as: "The miniature, three-dimensional group consisting of small modeled and colored figures and specimens, with accessories, in an appropriate setting, and in most instances artificially lighted. The scale and size of the group is variable; there is no standard shape; there is no limitation as to subject matter, which may be realistic or imaginative according to what the creator of the group wishes to portray." *

Forerunners of the diorama are to be found in the religious crib, displayed at Christmas time, in small carved stage sets

* Defined by Cypher, I.F., "The Development of the Diorama in the Museums of the United States." New York: New York University, 1942, Ph.D. Thesis.

and models, in panoramas, and in the natural habitat groups found in museums. The diorama, or small group, is an inexpensive, practical way of bringing the world of reality and of imagination into the classroom.

As the average diorama for classroom use is usually about 12 inches high by 24 inches long by 12 inches deep, it will easily fit on a teacher's desk or on a window-sill, a table or a shelf in the average classroom. Small-scale dimensions have not proved a barrier to its effectiveness. And the three-dimensional qualities of the diorama enable it to give an illusion of reality which makes it an excellent medium whereby to visualize and vitalize any subject. Cardboard cut-outs, mechanistic groups with moving trains and tractors, and Punch and Judy theaters are not dioramas. A diorama may be made by pupils, by teachers, or by both working together. The illusion of reality makes the diorama an excellent aid in teaching historical and geographical subjects, for its three-dimensional qualities and modeled figures give depth and body to any scene presented.

MODELS, OBJECTS, SPECIMENS. It may often be found helpful to have actual specimens or scale-models to illustrate certain lessons. When using materials of this nature, great care should be taken to explain to students whether or not they are seeing and handling a true-size specimen or a model made to scale. In the vocational and industrial and mechanical arts classes, the making of the models often con-

TYPICAL CLASS- ROOM AIDS

stitutes the lesson itself. In other subject areas the skills utilized in making the models may be incidental to a knowledge of how the object moves and works and functions. Specimens are an important aid in science classes and nature study classes. Actual specimens of birds, animals, reptiles, flowers or rocks are important in teaching how to recognize these objects. Specimens of Indian beadwork, Venetian glass, African ivory carvings are priceless, not because of their intrinsic monetary value, but because the handling and seeing of them gives the student an opportunity to contact the work and artifacts of another people. Firsthand contact with the crafts of another people does much to level barriers.

OPAQUE MATERIALS. This type of material and the opaque projector are of great advantage in schools where it is difficult to procure other audio-visual aids. Pictures from magazines and books, color-prints, original drawings in black and white or in color, and postcards may be used. Even the most distant rural communities would have some of these materials available.

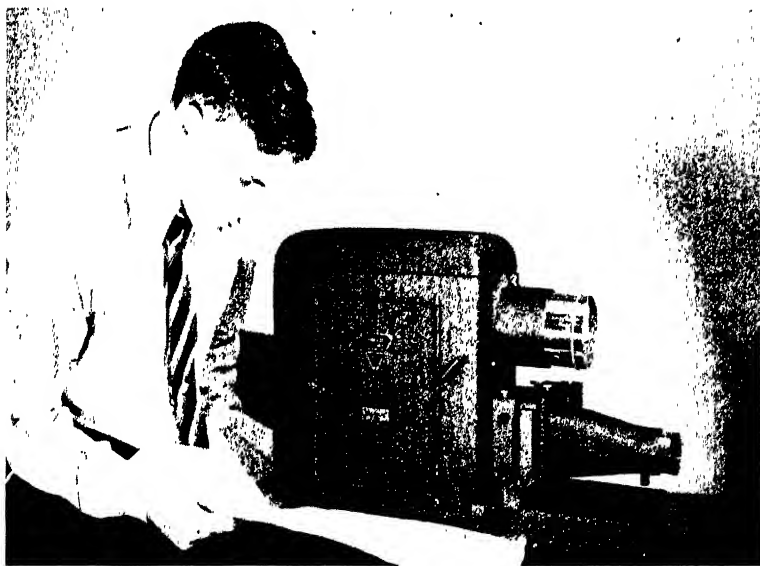
Pictures and objects may be presented separately or in related sequence. Pictures shown by the latter method are more effective if they are mounted on a strip of paper of the width required for use in the projector, and long enough to take care of the picture sequence. This strip of pictures may be folded, placed on the picture-plate of the projector, and each picture on the strip released as desired.

LANTERN
SLIDES

The disadvantage of the opaque projector is that it is heavy to carry and more difficult to “frame” the picture for projection.

LANTERN SLIDES. Lantern slides were one of the first teaching aids to be called “visual aids.” Today a teacher should specify whether she is using the “standard” lantern slide, which in America is $3\frac{1}{4}$ inches high by 4 inches long, or the small 2 x 2 inch slide. This latter slide, if it is a photograph in natural color, is usually called Kodachrome (really a trade

The versatile opaque projector makes possible the use of many varying visual materials.



TYPICAL CLASS- ROOM AIDS

name), and refers to the picture in color on 35 mm. film which has been processed and mounted in a 2x2 inch mount or frame. This same 2x2 inch size lantern slide, however, may consist of black and white film so that, properly, we should not call this size slide Kodachrome.

The standard $3\frac{1}{4}$ x 4 inch lantern slide may be drawn in ink or crayon on clear glass, etched glass, or cellophane, or lumarith, covered with a cover glass and bound; or it may be made by a photographic process and the resulting photographic slide covered with a cover glass, masked, and bound. In either case, the result is a glass lantern slide (in color or in black and white) which must be inserted in a lantern slide projector and projected on a special screen, on a white wall, on a shade or other flat surface which enables one to see the picture.

The small lantern slide, as explained before, is photographed either in color or in black and white. The resulting pictures are mounted singly either in cardboard mounts or put between glass and bound as in the case of the standard slide. This latter process serves to protect and preserve the film. This slide, too, must be inserted in a projector and projected on a screen.

Whether the lantern slide is standard or small size, its value lies in the fact that (1) it brings pictorial material into the classroom; (2) the projection on a screen enlarges the picture so that it may be examined and studied; (3) the projected picture remains still and steady so that details may be noted and commented upon.

LANTERN SLIDES

Lantern slides of either size may be made up in sets and shown in some particular rotation or they may be rearranged and shown in different order as the need dictates. As many or as few slides may be shown at a time as a teacher desires to use, and the operator of the projector determines the speed at which they are shown and changed. Each size lantern slide requires a projector constructed particularly for that size slide. However, where schools do not have projectors for the small size slides, adapters to hold these slides may be made or pur-

Large projectors, ordinarily used for showing standard $3\frac{1}{4} \times 4$ inch slides can easily be adapted for showing small 2×2 inch slides.



TYPICAL CLASS- ROOM AIDS

chased, and used in standard size lantern slide projectors.

As is true with many types of visual aids, the value of lantern slides may lie in the research and study involved when pupils themselves make the slides. Slides purchased or borrowed from commercial sources and servicing agencies will, of course, be more "finished" products and their value lies in the wide variety of material from all over the world that they bring to the classroom.

FILMSTRIPS OR FILMSLIDES. A modern adaptation of the lantern slide is found in the visual aid variously called film slide, filmstrip and stillfilm. Stillfilm was the original trade name under which it was first manufactured and applied to a roll of film attached to a spool and pulled by hand through an adapter attached to a lantern slide projector. Today spool and adapter are no longer used. Instead, especially designed projectors are made to project filmstrip. Filmstrip is the preferred name and the one most often used, although film slide is not altogether incorrect.

Filmstrip is made by photographing scenes or objects on narrow gauge, 35 mm. film, which contains sprocket holes along each side of the film. This film is processed and the finished roll of film projected on a screen by means of the special projector. (Projectors are available which may be used for both filmstrip and the small size lantern slide.) Filmstrip may be in black and white or in color. Titles may accompany each picture, or, as is often the case, a manual accompanies each

FILMSTRIPS OR FILMSLIDES

roll of filmstrip and comments and explanations may be made by teachers or pupils. The operator of the projector controls the speed at which the filmstrip is turned and may turn the film forwards or backwards at will. One advantage of filmstrip is its lightness and portability, since twenty-five to one hundred pictures may be placed on a single strip of film which can then be rolled and stored in a small light metal container. If

The filmstrip and its projector have the advantage of lightness and portability.



TYPICAL CLASS- ROOM AIDS

desired, the strip may be cut into single pictures and each picture mounted in a 2x2 inch frame. Technically speaking, these are the "film slides" and the entire roll of film the filmstrip. Teachers and students may make their own filmstrip, thereby gaining many valuable lessons in the production of visual aids. A disadvantage of filmstrip is that the sequence of arrangement is fixed so long as the strip is kept intact, and the order in which scenes are shown cannot be changed to suit different presentations.

STEREOGRAPHS AND STEREOSCOPES, ANAGLYPHS AND VECTOGRAPHS. A stereograph is a double picture usually mounted on cardboard and inserted in a special viewer or instrument known as a stereoscope. The factor that makes this visual aid of value is that the flat pictures thus viewed take on three-dimensional qualities which make objects in the foreground stand out as though real against the background. This method of viewing scenes was popular in our grandmother's day and is still of value today.

The photographs viewed have been taken by a camera with double lenses separated by a distance equal to that of the normal distance between a man's eyes. One exposure is for the right eye and the other for the left. The resulting picture is viewed in a double optical unit in which the lenses are similarly spaced. When this viewer is properly focused by the one using it, the picture viewed takes on an illusion of depth and reality.

STEREOGRAPHS
VECTOGRAPHS

The stereograph is for individual use. It is an excellent visual aid where it is desirable to have individual pupil research and study. It is, because of its nature, not entirely satisfactory for group study, although each member of a group may, of course, eventually view the same pictures.

An adaptation of the stereograph, known as the orthovis or anaglyph, may also be used to achieve an illusion of reality. In this device a stereographic picture is printed in two colors (usually red and blue), one superimposed upon the other and examined through a special viewer containing one red lens

For individual pupil study, stereoscopes are excellent visual aids.



TYPICAL CLASS- ROOM AIDS

and one blue. The blending of the colors as seen through the viewer gives depth and roundness to the picture, making it seem quite real and lifelike.

Still another adaptation of the stereograph is the vectograph. Here the print or picture may be in color or in black and white, but the two photographs taken are printed on opposite sides of a polarizing film. The resulting print is then projected on a screen for individuals and groups to view. Each member of the group, however, must use a special polaroid viewer or the print will not appear to have three-dimensional qualities. This type of visual material was employed to a large degree by both the Army and the Navy during World War II and is being adapted for motion picture use. At present it must be made by professionals and has not been used to any great extent by schools.

MOTION PICTURES. It is no longer necessary to define a motion picture, for motion pictures are available in every community. For the classroom teacher the decision to make with regard to their use is whether or not to use sound or silent motion pictures, black and white or color, and 35 mm. or 16 mm. film.

The last problem is most easily answered. 35 mm. must be projected from a fireproof booth by a licensed operator. Few schools have either the equipment or the necessary operator so that this type of film is used mostly in large auditoriums or for special occasions.

MOTION PICTURES

Most classroom motion pictures today are made in the 16 mm. width, noninflammable, acetate base film. Some of the smaller 8 mm. width film is to be found, but this is generally in use in homes. The 16 mm. film has come to be almost standard school equipment. The usual reel contains four hundred feet of film and takes about 12 minutes to project.

A student operating a sound motion picture projector in a Portland, Oregon, public school.



TYPICAL CLASS- ROOM AIDS

The next two questions depend upon the school equipment, the need of the moment, and the technique best suited to meeting the need. If a school has only a silent projector, sound film cannot be used. If the projector is a sound projector, the sound track on a film may or may not be utilized. There are times when it is best for all purposes to run a film without the sound track so that students may not be influenced in any way, or so that the teacher may make her own comments.

The question of whether to use black and white or color film is usually answered for the teacher by the film producers. Many films are obtainable only in black and white. Where color prints are available, the teacher herself should judge which type of film best meets the needs of her class. Good black and white is preferable to poor colors. Many subjects, such as operation of machines and similar topics, are clearest when shown in black and white. Color is helpful when identifying geographic features, peoples, costumes and natural objects. Color processing has improved, and films taken in true color seem generally to take on a greater degree of reality than those taken in black and white.

The motion picture, because of the factor of motion, shows peoples and objects in action. This very factor, however, coupled with the speed at which a film is projected makes it impossible to hold any one scene for lengthy examination, but the movement and action in the film have the advantage of creating an illusion of reality and make subjects real to students.

Teachers should never use motion pictures for teaching purposes without first previewing them. Where sound effects are essential to the understanding of the subject matter shown, sound films should always be used. The motion picture should not be used to "fill in" vacant periods, for recreation only (except in cases where the program is frankly an entertainment), or as a substitute for careful, well-planned teaching. The motion picture is not a rapid, sure-fire way of teaching everything and should not be considered as such.

Motion pictures are available today for use in practically every subject area. Excellent films are available from commercial and industrial sources, from museums, from community organizations, clubs, historical societies, state and federal agencies and many other sources. They should be brought into the classroom and used wherever and whenever possible.

It is not difficult to learn to run a motion picture projector. Every teacher worthy of the name should learn to use this equipment and make it part of her methodology and techniques. Schools should provide the best equipment they can afford and principals should see to it that teachers have the opportunity to use the equipment to best advantage for all concerned.

It has often been found advantageous to form "Visual Instruction Squads" and train students in the use of visual equipment. This practice has helped meet the need for projectionists when only one teacher knows how to run the machines, and has also instilled a respect for the equipment in the students

TYPICAL CLASS- ROOM AIDS

themselves. Such squads, however, should always be under teacher guidance and supervision for best results. It is also a practice which works best with older students. Younger students are more likely to be careless with equipment and to become upset when mechanical difficulties arise.

RADIO, RECORDINGS, AND SOUND SYSTEMS. Many schools and classrooms today have facilities for the utilization of radio, and phonographic recordings in classrooms and auditoriums. The phonograph and records are fairly well known to most people. Records used in schools may be orchestral selections, instrumental pieces, songs, dances or speeches.

In addition to the kinds of records just listed, there is the transcription, or recording made of a radio program, a speech or other public event. These transcriptions make it possible to bring into the classroom programs and speeches dealing with current events and the spoken word, and help to vitalize facts that might otherwise be little more than the printed word on a page of a textbook. Schools should be equipped with phonographs and play-back machines so that these recordings may be used in conjunction with other types of materials.

Radio is a two-way audio-visual aid—it works from without and from within the school. Programs originating in radio studios, under technical supervision and professionally directed, may be brought into the classroom through the medium of radio sets and loudspeakers installed in the classroom.

RADIO, RECORDINGS
SOUND SYSTEMS

By this means, programs prepared directly for school use, famous concerts, public events, may all be made a part of the learning experience of the students.

Radio from "within" the school may take the form of programs prepared and carried out by the students themselves. If public address equipment and microphones are installed in

The phonograph is a valuable audio aid in nursery school as well as with older groups.



TYPICAL CLASS- ROOM AIDS

a school, students can then put on their own programs. The experience gained from writing scripts, timing and planning programs, and carrying out mechanical details are all of great value for students today. Frequently this type of experience lays the groundwork for future vocational training.

STORY-TELLING, ILLUSTRATED TALKS, DEMONSTRATIONS. The human voice is the first "audio-aid" that a teacher has to draw upon. Well-told stories, whether in nursery school or high school classrooms, make vivid and lasting impressions. Many times some legend or little-known account of details not covered in a textbook will change pupil attitudes and reactions towards a subject. Teachers should include the telling of stories by themselves and by pupils in their planning of audio-visual aid programs.

The story illustrated by carefully selected lantern slides, pictures, films, dioramas or other visual aids, which supplement the details supplied by vocal descriptions, can be made an effective aid in a teaching program. This type of presentation is particularly important in the area of social studies, art and English, but it could also be used to advantage for mathematics, science and vocational studies.

Science teachers have for years been familiar with demonstrations whereby certain principles in chemistry, biology, or physics have been shown. Scientific equipment, such as microscopes and other apparatus have been used in these demonstrations. This equipment should be supplemented today with

TABLEAUX, DRAMATICS
SONGS, DANCES

the inclusion of the other aids already mentioned. Demonstrations of techniques should not be confined to the science classes, but should be utilized in all subject areas.

TABLEAUX, DRAMATICS, SONGS, DANCES. Tableaux, plays, in fact, all dramatic presentations are audio-visual aids. This is particularly true when the dramatic presentation is built around some historical event or social episode. In the preparation and presentation of such programs all the various types of visual aids may be called upon; slides may be

All dramatic presentations are audio-visual aids whether they be flower pageants by elementary pupils, or elaborate performances.



TYPICAL CLASS- ROOM AIDS

shown for the makers of the stage scenery and costumes to study; records played to familiarize the orchestra with the music; radio programs listened to as models of good speech and diction.

The final presentation itself is, of course, an audio and a visual program both for those giving it and for those watching. Although the entertainment factor may seem uppermost in such presentations, many lessons are learned in the preparatory period that will be of value in more formal class periods.

Songs and dances are an almost universal language for mankind. An understanding of the songs and dances of another people leads to an understanding of the people themselves. Songs and dances should be included both in single class projects and in group and school projects.

"TREASURE TRIPS"—FIELD TRIPS. The audio-visual aids described thus far have all been those used within the classroom or school building, but there often comes a time when effective teaching demands contact with materials outside the school. "Treasure trips" or field trips supply this need, but they are of real value only when carefully planned and correlated with classroom work.

The treasure trip may be a visit to a museum or community center where objects of art, natural history, or science may be seen under the guidance of trained leaders and in accordance with pre-planned programs. It is a field trip, but one in which the teacher knows that every step of the way has been planned

. TREASURE
TRIPS



This *Baluchitherium* just won't fit into a classroom. Treasure trips to museums are invaluable when correlated properly with school work.

TYPICAL CLASS- ROOM AIDS

to fit into a definite over-all pattern designed to enrich the students' experiences.

Field trips may be taken to parks, zoos, famous buildings, docks, factories, libraries, stores, to any place whose resources will help vitalize the lesson of the moment. The best trips are those well-planned in advance; those for which preparatory and follow-up work are provided; those which do not include so great a variety of things to see that physical fatigue interferes with appreciation of the things seen; those in which the student is encouraged to return on his own time or with his parents to see more. The field trip combines the hearing and seeing of things, and a teacher should try to include at least one, and sometimes many, such experiences in her programs.

COLOR AND SOUND. The use of color and sound has taken on increased importance today. The world around us has color, and we are constantly listening to sounds.

In selecting audio-visual aids the teacher should strive to get those which give as realistic and natural pictures of subjects as possible. In the selection of sound equipment, those aids should be used which give as good tonal qualities as possible. It is better to use non-colored and silent materials than to use those which give false impressions.

Research in these two fields, however, has made great strides. Motion pictures, slides, filmstrips, dioramas, and most of the other aids mentioned in this chapter, have reached a point where there seems but little more that can be done to

improve them. The changes that will be made to adapt them to meet teaching situations more effectively will be in the application and use of color and sound.

RELATIVE ADVANTAGES. There is no one perfect audio-visual aid. The sooner we find this out, the better. The audio-visual aid, or combination of aids, which can produce the most effective result in a given teaching situation should be considered best—but only in that situation.

When an illusion of reality is desired, a diorama will usually achieve this. When it is desirable to see persons and things in action, living and moving, the motion picture is usually the best aid to employ. When lengthy and detailed examination is desired, the best results will probably be attained by the use of mounted pictures, lantern slides, and filmstrips—or actual specimens themselves. Diction and speech are helped by listening to recordings of famous speakers and to radio programs.

No one can tell a teacher exactly what to use. The good teacher knows the pupils in her class, their weaknesses and their strength. If she is worthy the designation of teacher, she will have as many types of supplementary materials at hand as possible, and then use them singly, or in combinations, in the ways which she feels will help her make the subject under consideration come alive and acquire reality and solidity for her pupils. Audio-visual aids are particularly effective in certain types of programs. Succeeding chapters will indicate what these are and offer suggestions for using them.

iv. Radio and Television

Example of Program



THE APPEAL TO THE EAR today is increasingly extensive. Through the radio which may be found in most homes and many schools, we have all developed the habit of listening. No other medium is more powerful in social life and education in making children—and adults—world-conscious. No other medium can make it possible for so many to share an experience at the same time. No other medium can so completely remove space and time and so effectively eliminate differences between city and rural ways of living in various countries.

RADIO. Radio programs are not only popular in appeal but many of them are of direct or indirect educational value. Through the imagination of the listeners which creates pictures in keeping with the audio appeal, there is also strong appeal to feeling, to emotion. The play or dramatized story is vitalized by sound effects, the characters take on form and personality as the listener identifies himself with the action of the plot. Many radio programs have definite educational objectives. Several of the programs of the large nation-wide radio networks are planned to integrate with various areas in the curriculum, to increase the interest of boys and girls and to promote leisure reading.

Some educational programs are more effective for school use in one part of the country than another, because of the

RADIO AND TELEVISION

time element which allows the inclusion of these programs during school hours. Other programs, not available in school hours, also serve to enrich and vitalize literature, humanize history and the sciences, encourage the desire for good music. Short stories, novels, plays, even Shakespearean dramas, are presented. Various "Theaters of the Air" in which well-known managers, actors and authors take part, not only enrich literature *per se*, but promote, by example, better diction and voice and a richer vocabulary. Often they encourage the application of the interest aroused by the program to the writing of original material. Boys and girls may be guided in their critical judgment of programs which are truly literary and equally, if not more, interesting, than those which are of no value in the enrichment of any area of the curriculum or in character development.

Although the radio must entertain as well as educate, the two may go hand-in-hand. Educators, broadcasters, sponsors should—and no doubt will—cooperate more closely and more intelligently, for only by each recognizing and understanding the aims and problems of the other, can better and more stimulating educational programs be prepared which will be acceptable, also, from the point of view of entertainment. Then the radio, through station programs, their transcriptions and recordings, will become an increasingly powerful audio-aid in education. What radio has accomplished for politics, news, and commercial advertising, it can and should do for education.

Today, more than ever before, radio programs bring the world to the home and the classroom, bridging time and space. Radio is of inestimable value as a medium of communication in an age of communication. It is our greatest means of communication, since distance from centers of learning is no hindrance. In the United States alone there are four coast-to-coast networks, thirty-five regional networks, nine hundred and thirty local stations, and sixty-five thousand fifteen-minute units of program service daily. Under a new system of radio engineering, "frequency modulation," there may be as many as ten networks. But why are there, today, so few educational institutional stations? Is it lack of funds, lack of interest, lack of technique? Why are there not more stations like WHA College of the Air, the University of Wisconsin's "broadcasting outlet" in Madison, which brings to its listeners courses conducted by University professors, home and agricultural information through the Home Makers' Hour and Farm Program? Surely this station has been an aid to community education.

TELEVISION. Radio has, of course, supplied information through the medium of "hearing." Television will bring to us the "seeing" or visual medium. When we actually show a program in a classroom as well as listen to it, audio-visual aids will be functioning as complete units for the enrichment of classroom teaching. There is no doubt but that television has great possibilities as a visual aid. It also has limitations which

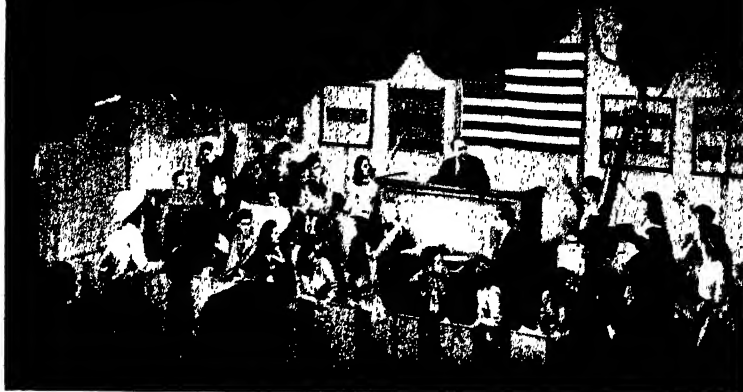
RADIO AND TELEVISION

have not as yet been overcome in a sufficient degree to make it possible to use television to any extent in the classroom itself. Scientists and engineers are making progress, however, and it is to be expected that these difficulties will soon be eliminated.

The entertainment potentialities of television are accepted facts today. The educational potentialities have not yet been fully realized. At present the size of the screen on which the televised image or picture is shown is too small for classroom use. The average class is too large to be seated so that all may see the picture. Secondly, television sets are expensive and the value to be derived from their use is not sufficient to warrant expenditure of school funds for this type of equipment. Larger television screens are being manufactured and it has been predicted that in about five years' time television sets will be as common as radio sets are today.

The usual procedure now is for classes to visit a television studio if this medium is to be employed as a teaching aid. Most of the larger broadcasting companies are planning television programs suitable for junior and senior high school classes, but the classes must go to the studio to see or participate in the programs. Classes from schools in the cities where these studios are located have access to the television programs. It is difficult, however, for classes in rural areas to make trips to the studios. The programs are thus not available to them.

Example of Television Program



Scene from a high school student forum on current topics televised over WCBS-TV in collaboration with the New York City Board of Education.

AIR AND AIR PRESSURE. The American Museum of Natural History has pioneered in the presentation of educational programs through the medium of television. The following program is the result of a memorandum prepared by Mr. Julius P. Postal, Supervisor of Radio and Sound, for Dr. Charles Russell, Chairman of the Department of Education, both of that museum. It was prepared in order to give an idea of the potentialities and limitations of television. The film "Air and Air Pressure" used in the program was particularly well adapted to illustrate how the characteristics of television can be used to advantage. A plan to make special films for television use grew out of extensive experience in the presentation of experimental scientific and educational tele-

RADIO AND TELEVISION

casts. Some of these were entirely "live." Others combined "live" appearances by actors and scientists with film material.

It soon became apparent that live science telecasts were not only severely trying to the scientists, but were costly, time-consuming, and had an embarrassing way of developing unpredicted quirks. For instance, snakes would become nervous or extremely active under the hot lights. Or life-like artificial flowers of the type for which the Museum is famous, would soften and melt. Then, ultra close-ups involving follow-focus, which require extreme care under the most favorable circumstances, would go out of focus at precisely the wrong moment.

The technical problems are not insurmountable; they are well on the way to solution. But it is unlikely that the movements of a baby raccoon are ever going to be as predictable and as controllable as those of a trained actor or actress.

The simplest of laboratory demonstrations, which presents no problem in a high school physics laboratory, can put a television crew into a state of fidgets when it is a matter of split-second timing.

One thing that will probably never be eliminated is the ever-present need in television for rehearsal, *more* rehearsal, and *still* more rehearsal. To a school, a teacher, or a scientist, the time factor is apt to be a real deterrent. Furthermore, once a thing is done before a television camera, and has gone out over the air, it cannot be recalled, re-edited, or done over again. This is a limitation from which film, fortunately, does

not suffer. Also, in film production, the burden of carrying off an easy, natural, sustained performance is not as trying to the amateur-actor, given proper direction, as it is in television.

In short, although television potentially has an immediacy and a directness which film cannot duplicate today, television will always have to lean upon motion picture techniques for flexibility which is not inherent in the new medium.

Many television people look to films as a means of cutting down the high cost of producing "live" telecasts. Although there are film-wise people in television today, a great many other people associated with the new art do not sufficiently appreciate the costs of film production. Whether pre-filming will actually afford material savings to television companies remains to be seen. However, pre-filming will prove a boon where studio and rehearsal facilities are limited. It will also ease the problem of personnel allocation during the actual telecast.

The usefulness of television in the classroom will depend to a large extent upon the production of less costly receivers and the availability of large-screen receivers. The production of these is merely a matter of time, as is also the production of color television.

To meet immediate possibilities for television, the program "Air and Air Pressure" was prepared as a television film-project. It is designed to demonstrate a few scientific principles by means of things which are available in the home environment. It may be used as a guide for classroom demonstrations.

RADIO AND
TELEVISION

AIR AND
AIR PRESSURE

A Tele Science Production

Photographed and produced by
Julius and Naomi Postal

All we want to do is to
show you a few simple demon-
strations which you can
stage in your own home.
More detailed information
can be found in textbooks.

(*Music under the following titles*)

Opening Title: AIR AND AIR PRESSURE*

Second Title: A TELE-SCIENCE PRODUCTION

Third Title: PHOTOGRAPHED AND PRODUCED BY
JULIUS AND NAOMI POSTAL

Fourth Title: ALL WE WANT TO DO IS TO SHOW YOU
A FEW SIMPLE DEMONSTRATIONS WHICH YOU
CAN STAGE IN YOUR OWN HOME. MORE DETAILED
INFORMATION CAN BE FOUND IN TEXTBOOKS.

* This is part of an actual script of a television broadcast. (The left-hand column represents the "video", or visual component of the telecast—what would be seen on the viewer of the television receiver. The right-hand column is the narration to be spoken to explain and supplement the "video".) The narration has now been recorded on film and the entire program is available as a standard 16mm. sound film which can be run on any standard sound projector. It is available through The American Museum of Natural History, New York, N. Y. (Copyright 1946 by Julius and Naomi Postal.)

EXAMPLE OF
PROGRAM



TITLE: SOAP BUBBLES

A tumbler of soap-suds with a bubble pipe sticking out of the tumbler. Someone is blowing into the pipe but we cannot see his face.

DIFFERENT ANGLE: *Bubbles stream over the side of the tumbler onto the table.*

MEDIUM SHOT: *A small boy is blowing a long festoon of bubbles which pyramid down to the table.*

This boy is demonstrating a well-known phenomenon. He is blowing air through a bubble pipe into soapy water. The air rises in the form of globules surrounded by a very thin, taut film of soapsuds.

Every molecule in the soapy film strongly attracts every other molecule in the film.

The air inside each soap bubble is under pressure—greater than that of the surrounding atmosphere.

RADIO AND
TELEVISION



A single large bubble grows upward out of the pipe bowl.

The pressure of the air inside the bubble is further increased because the soap film tends to contract and shrink inward.

MEDIUM SHOT of Mother blowing bubbles through wand-like affair at camera.

You'll notice that Mother is not using a regulation bubble pipe. She doesn't have to, because glycerine and other chemicals have been added to the bubble fluid to increase the surface tension and cause bubbles to form more readily. (2 second pause) These bubbles will last longer, before bursting, than those formed with ordinary soapy water.

EXAMPLE OF
PROGRAM



Starting with low angle shot. There's just no trick to it at all.

Anybody can do it.

Daddy's hands insert four ordinary soda straws into a jar containing some bubble liquid.

Yes, anybody, including Daddy can do it. But Daddy has to experiment. Will it work with ordinary soda straws? What do you think? . . .

Daddy's hands begin to lift the straws out of the bubble liquid.

LONG SHOT, from side: Daddy lifts the four straws to his lips. Daddy gets more bubbles, but they are smaller.

A cascade of small bubbles issues from the straws.

Bubble pipes may serve no other purpose than amusement. On the other hand,



LONG SHOT of top of washing machine. The agitator is working. On top of the water is a layer of creamy suds that appears to be two or three inches thick.

Identical set-up as in previous shot. Mother's arm enters frame. She draws her hand through the layer of foam, leaving a long trail, then lifts up a handful of the very fluffy suds.

bubbles in the laundry may indicate whether a tubful of water is ready to do the wash efficiently.

Most laundry soaps and powders will lather richly if the water is "soft" and at the right temperature.

Generous bubbling indicates that the soap is well distributed throughout the water. The foam is now very light and fluffy. There is soap in this foam, but in the main, it consists of hundreds of thousands, perhaps millions, of tiny globes of air.

EXAMPLE OF
PROGRAM



TITLE: AIR PUSHES EGG INTO MILK BOTTLE

MEDIUM SHOT of Mother tearing a newspaper into strips and pushing the strips loosely into a milk bottle.

You can try this simple experiment with air pressure in your own home.

A hard-boiled egg, from which the shell has been removed, is big enough to seal the mouth of the milk bottle, yet sufficiently yielding to squeeze through the neck of the bottle when pushed in by air pressure.

Peter, the cat, watches intently.

Peter, the family cat, who loves to eat eggs, watches hungrily. Mother will give him the egg, after she retrieves it from the bottle.

RADIO AND
TELEVISION



Matches are struck and brought to the bottle's mouth.

ULTRA-CLOSE-UP: The matches are lowered into the neck of the bottle.

The newspaper strips are seen burning brightly inside the bottle.

The egg is placed in the mouth of the bottle.

The plan is to create a partial vacuum within the bottle so that the external air pressure will cause the egg to be sucked inside. We can accomplish this by burning strips of paper inside the bottle. The heated air will expand and some of it will be driven out.

Once the egg is in place, the flame will suffocate and go out. The expanded air will cool off and shrink in volume, thus giving us in the bottle the partial vacuum we need.

EXAMPLE OF
PROGRAM

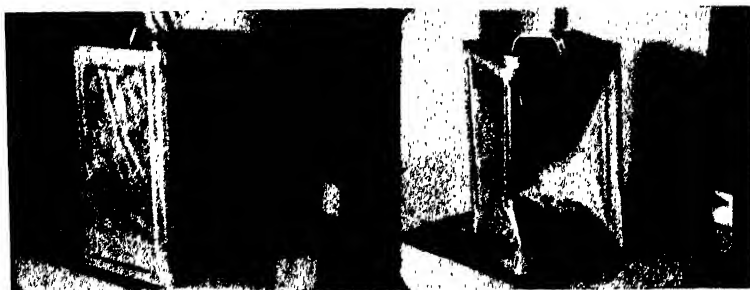


CLOSE UP: *By stop-motion photography the egg's descent into the milk bottle is speeded up. After oozing, as it were, through the neck, it drops suddenly into the bottom of the bottle.*

LONG SHOT: *Peter, the cat, is eating the remains of the egg out of a dish.*

This process usually takes several minutes. Stop-motion photography speeds up the action.

Peter, the patient cat, gets the egg after Mother removes it from the bottle with a fork. Columbus may have made an egg stand on end, but I'll bet he never knew that trick!



TITLE: AIR PRESSURE CRUSHES CAN

A five-gallon can is lifted onto a gas range. A glassful of water is poured into it. The flame is applied to the gas burner.

How strong is a tin can? In a moment we'll see what 10,000 pounds of atmospheric pressure will do to it. By the way, that's the pressure normally exerted by the air on a can of this size at sea level—15 pounds per square inch—or 10,000 pounds over its entire surface.

LONG SHOT: Steam is seen issuing from the can.

To create a partial vacuum in the can, we shall boil this water over the gas burner, and let the expanding steam drive out the air.

This will take several minutes.

EXAMPLE OF
PROGRAM



*Camera tilts upward until
steam fills most of the frame.*

If you try this in your own home, be very careful, because both the can and the steam get very hot. After the vapor has been coming out for two or three minutes, the next step is to screw on the cap quickly and turn off the flame.

*LONG SHOT: The can slowly
begins to buckle.*

The steam will now condense and return to its original state—water. (*Pause*) Since we drove out the air previously, a partial vacuum results.

*The can is now seen severely
buckled and distorted.*

Here is the can, crushed by 10,000 pounds—or five tons—of air pressure.

(End title with music)

v. Dramatic Presentations



DRAMATICS AS a method of curriculum enrichment is not new. Children have always liked to "make believe," to act, to project themselves into all kinds of adventures. They enjoy improvising and need no scenery or costumes to make the situation a real one to them. They *are*, for the time being, the characters they portray. A home-made microphone is all that is necessary for a radio program, and even the microphone can be imagined! Radio programs planned and presented by boys and girls have strong appeal in creative expression, are effective in a review of work, and create a deep interest in the area or areas of study presented. Book reviews, poetry hours, original stories, plays, choral reading and public speaking, take on added interest through this medium. If "television" is desired, stereopticon or kodachrome slides may be used to produce the effect and add further enrichment.

STAGE PRESENTATIONS. In an impromptu stage play, a table, chairs, and the suggestion of costumes are all that are needed. The imagination of the children will supply the rest. Perhaps that is why Chinese plays and Chinese paintings can always be understood and appreciated by children. They are able to feel and interpret the dramatic and painted scenes in the way the authors and painters meant them to do.

When costumes and scenery are possible in a dramatic presentation, whether tableau or "living picture", or the stage play, the visual appeal is stronger and—linked with the audio

DRAMATIC PRESENTATIONS

appeal—enables dramatics to become a powerful stimulus and aid in education. The enthusiasm which the simplest dramatic presentation kindles is in itself a guarantee to happy and effective learning and also a relaxing, therapeutic experience.

Through dramatizations, reticent children are often “drawn out of themselves” and their self-consciousness, and induced to spontaneous self-expression under happy conditions. The pageant, especially the community pageant, in which children of various nationalities often take part, promotes social tolerance and understanding as well as develops dramatic instincts and abilities. The pageant and operetta usually combine the cultural languages of all nations—drama, art, music and the dance. All those who deal with children know how versatile they are in all these media, how happy in each method of creative expression. Art, music, the dance, speech and diction are effectively integrated.

STORY TELLING. Every good dramatic presentation—whether radio play, stage play, tableau, pageant or operetta—has at its heart the story. The sound effects of the radio play help the visual imagination, just as the scenery and costumes of the stage play add true visual appeal to the audio, help interpret the story and make it vivid, for plays are stories in action.

Stories, presented graphically and dramatically, are helpful in any area of the curriculum, for there is inherent in every

STORY
TELLING

boy and girl a keen sense of the dramatic. Whatever is told them in a vivid, living way will never be forgotten.

In the middle ages the story-teller, favorite of kings and queens, lords and ladies as well as of boys and girls, made vivid before his audience banqueting within the tapestried and torch-lighted hall, a jousting scene or tournament with brave knights contending; or the song-story of Aucassin and his fair, sweet lady Nicolette. In like manner the story-teller

Story telling by the author Dr. Chandler in an Audio-Visual Enrichment Program in Hunter College Elementary School evokes an enthusiastic response from her young audience.



DRAMATIC PRESENTATIONS

of today interprets and vitalizes art, music, the sciences, history, and literature for boys and girls. Through the story the people of long ago become real and alive. There is a better understanding and enjoyment of the creations of their hands and minds and hearts. How much more vivid a story may become when visual aids—stereopticon and kodachrome slides, color-prints, habitat groups, dioramas and, most important of all, realia—add their appeal.

For example, a story about Crusaders becomes so much more real and vital when, through visual aids, the audience sees a suit of armor made of thousands of carefully welded metal links, like that worn by King Richard of the Lion Heart! A glimpse of the great hall of a castle with jester, serving man, knight and fair lady, torch light shining upon tapestried walls, gives the visual setting for the dramatic audio-appeal of the story, and increases its imaginative stimulus. A well-planned illustrated introduction to the story also may be used as an effective way to lead into the narrative.

It does not seem necessary to add that the story should be vivid and dramatic, that the action should move clearly and swiftly as the story-teller loses himself in the characters of the story who skillfully play their parts.

PUPPETS. The story, again, is the core of the puppet show, in which the spoken word is of great importance, although the technique of the story-telling is different. In puppet story-telling the voices which help in the various parts must be

PUPPET SHOWS

exaggerated to the same extent as the figure characters.

Puppetry may be traced far back into the days of old. For centuries, and in many different parts of the world, puppet shows have been given before appreciative audiences of old and young alike. We tend to think of such exhibitions as being

Participation in a puppet show is an opportunity to combine art and drama.



DRAMATIC PRESENTATIONS

designed for the delectation of young folk, but in the Orient adult audiences sit for hours enthralled by the gestures and movements of skillfully manipulated figures. In Bali the shadow play occupies the place filled in occidental life by the motion picture; in China, shadow puppets made of donkey-skin parchment were first presented to entertain aristocratic ladies who could not leave their homes to attend the theater. Puppet shows were a popular form of entertainment in Asia and in Europe for many years. The Punch-and-Judy show is another type of puppet show which has long enjoyed favor, and today there is a revival of interest in this form of artistry.

HAND PUPPETS. Today puppets and puppet-shows have a distinct contribution to make to audio-visual enrichment programs. The simple hand puppet, consisting of a head with a costume-body into which a child may thrust his hand is easily made by the pupil and particularly effective with classes of young children. The heads may be made of cloth, stockinet, balsa wood or paper; the costumes may be simple lengths of cloth shirred to the head. These puppets are popular with children in pre-school and lower elementary school classes. Simple stories may be dramatized with puppets of this type, and lessons "acted out." One good practice is to make hand puppets of favorite characters from story books and then to enact the stories themselves. This procedure enables a child to visualize stories which have been told to him or which he is just learning to read.

STRING PUPPETS. String puppets are more complex to make and operate, but they are effective visual media. They have a greater appeal for older children than do hand puppets, and some very fine puppets have been made in high school art classes. They may be mere simple figures, or they may be intricately carved and carefully costumed. The production of a puppet show, with string puppets, affords an opportunity to combine work done in art, English, and dramatics classes; it is also a splendid project for a dramatic club to undertake.

Research and study are necessary in order to make representative figures, correctly costumed. Craftsmanship of a high order is essential to insure carefully molded or carved figures. Attention must be given to speech and diction by the students who are to act as "voices" of the puppets. The successful manipulation of the strings controlling the puppets requires coordination and timing—all of which afford good training for students participating in these programs.

Recently a very effective puppet show dealing with dental hygiene has been given in many of the schools of New York City. Many lessons might well be dramatized and made more graphic if presented as puppet shows. There is no reason why the puppet characters and story script should not deal with actual social situations and personal problems encountered by children as well as with fictional stories. We have here a visual medium which has not been fully utilized by the schools, and which should be included to a greater extent as part of the audio-visual program.

vi. Treasure Trips

Example of Trip



MOST EFFECTIVE of all the types of audio-visual enrichment is the "Treasure Trip", the school trip or journey. It has been highly approved from very early times. John Comenius, "Father of Visual Education," whose *Orbis Pictus* of 1638 was the first illustrated book, commended it. The educator, Jean Jacques Rousseau of the eighteenth century, advocated it in his "Education of Emile", and Johann Heinrich Pestalozzi, the Swiss educational reformer of the late eighteenth and early nineteenth centuries, approved it.

School trips or journeys were used in English education as long ago as 1905 and 1908. France and Belgium developed this type of visual aid before World War II more extensively than did the United States. Short and long trips were practised, even inter-school visits, pupil exchanges, and youth hostels, which have also been encouraged here.

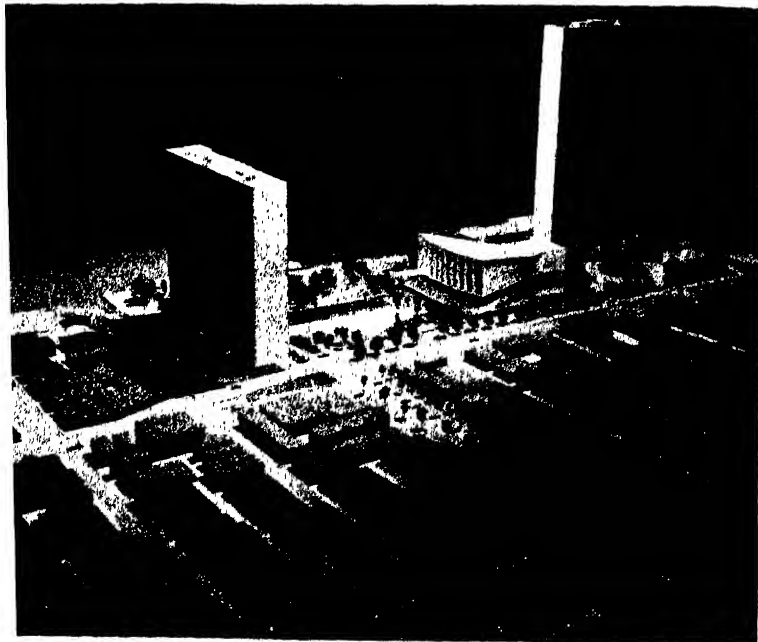
Some still feel that all education should be in the school-room, and that community agencies such as museums, libraries, historical sites, markets, botanical gardens, shipping departments, factories are not a vital part of education. Modern educators, however, now realize the intrinsic value of this reality of experience, although the problems of sufficient time and heavy school schedules often prevent its effective use.

An important objective in education is that our boys and girls know their immediate environment, its history, ideals and achievements reflected in places and monuments of

TREASURE TRIPS

artistic, historic, literary, civic, industrial, commercial, and recreational interest. That knowledge can best be acquired through direct experience, through Treasure Trips carefully planned and motivated; and carried out with purposeful and meaningful correlation with the curriculum. These provide firsthand, basic experience in the activities of the children's immediate world, their "world of reality".

Of great significance to everyone is a trip to the United Nations' General Assembly. This is a model of the proposed permanent UN headquarters in New York City.



Through this vital type of audio-visual enrichment more accurate information is gained and retained, more interest aroused than by any amount of verbal learning or, in most cases, by any other visual aid, although various types of audio-visual aids are invaluable in preparation for the trip. School becomes a part of life, learning a happy experience, as pupils and teachers work together in planning and carrying out this experience. The resulting discussions are equally important because of the pupils' active participation. The richness of individual experience in these "journeys" gives each child something to contribute.

The school journey is the most real and the most concrete of the visual techniques and it is the most accessible and often the least expensive. It stimulates a desire for individual and group research, increases the power of observation, intensifies appreciation of original materials ("treasures") in their proper settings, and provides a clearer understanding of their relationships. This functional learning outside the walls of the schoolroom, this most concrete of all audio-visual enrichment, is especially helpful in the development of the units which children and teachers have chosen. These Treasure Trips are recognized as invaluable in education, whether they are group or individual, whether in or after school hours, when they are carefully and cooperatively planned and executed, creatively followed up, and critically evaluated. It would hardly seem necessary to suggest that the teacher become acquainted with the material, the goal of the trip, before the class visit.

TREASURE
TRIPS

"TREASURE HOUSES" OF REALIA. There are museums and libraries, historic sites, and monuments in most of our cities and towns where treasures have only potential value unless they are enjoyed. The word "Museum" in the minds of adults even today too often connotes merely a storehouse of ancient objects divorced from life. That feeling is partly due

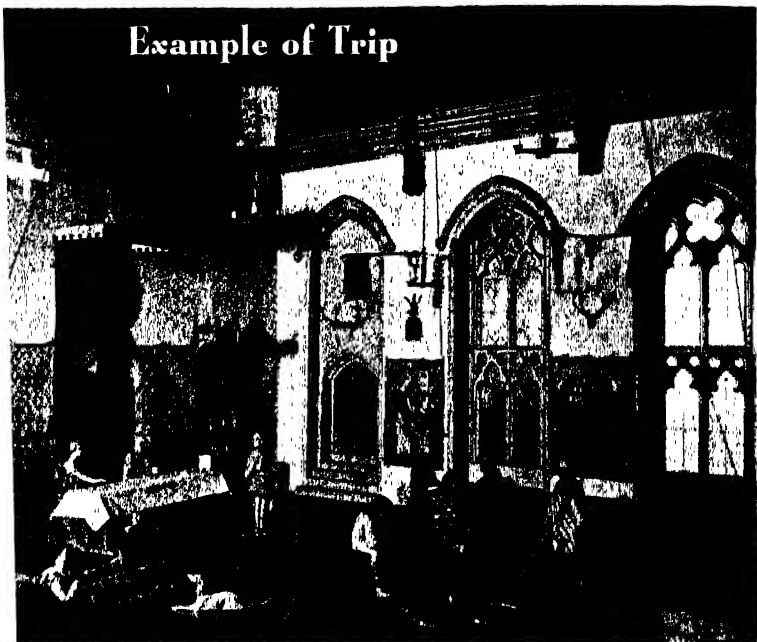
Nature study at the zoo draws the undivided attention of city children.



to an attitude which has developed on the part of the public, but is more often the responsibility of museum officials who have considered their treasures alone, rather than the people to whom these treasures partly belong. To the youth of this generation, an art museum is not a storehouse of statues on pedestals, of pictures encased in deep and wide gilded frames so high on the walls that they cannot be seen, or of treasures arranged with little thought for the convenience and capacity of the beholder for personal enjoyment. It is a Treasure House full of light and color, of ancient and modern treasures arranged with the spectator in mind and the purpose of reflecting the lives of those who created them. A museum of natural history simulates life itself in its habitat groups, models and dioramas with their natural settings and exactness of scale and color. Museums of science and industry appeal to the sense of touch as well as to those of seeing and hearing in their mechanical models which the visitor may manipulate. Most museums feel that children should be allowed and encouraged to enjoy their finest treasures.

Botanical Gardens for nature study classes, the zoo for the younger children, airports, harbors, markets, city halls, civic centers, churches, factories, restaurants where food, music, and costume are like glimpses of other lands, offer Treasure Trips which will humanize and vitalize every area of the curriculum.

Example of Trip



Model in the Metropolitan Museum of Art (New York) of a castle banquetting-hall which vividly portrays a phase of life in the Middle Ages.

(This Treasure Trip is not suggested for any one age level, but should be adapted by the teacher for Elementary, Junior or Senior High School groups, to make use of the audio-visual materials in the specific community in which the school is located.)

As an example, consider a trip in New York City back to the days of Knights and Pages, Castles, and Cathedrals. Other cities and towns would have other Treasure Trips for the enrichment of chosen areas in the curriculum. In outlying dis-

tracts where such Trails as this are impossible, "Imaginary Treasure Trips" may be taken through the help of audio-visual aids which may be procured from various sources.*

Before the trip, discussion in class has integrated social studies, language arts, art, and arts and crafts. It has vitalized those areas by pupil and teacher research and by carefully selected and arranged stereopticon or kodachrome slides of castles, cathedrals, lords and ladies in medieval costume, knights in armor active in jousts and tournaments. Some children will have brought from home pictures of knights in armor, of castles with drawbridge and moat, of hunting and hawking parties, of banquets in castle halls. The teacher will have acquainted herself with the museum treasures, either by herself or under the guidance of the museum instructor.

Then the trip itself which, through careful planning, has the eager attention of the group, and minimum fatigue, since too many treasures have not been included for the one visit. Boys and girls of today are transported back into those colorful days of the Middle Ages. In the Metropolitan Museum of Art they see knights in chain and plate armor made by artist-armorers who combined utility and beauty. How vivid the glimpse given of a castle banqueting-hall by a lighted model which shows dais, jester, serving man, page, lord and lady, even the fire upon the castle floor reflected upon the tapestries which decorate the walls! A model of a cathedral, a community work erected to the worship of God by builders, sculp-

* See Chapter XVI.

TREASURE TRIPS

tors and craftsmen who gave of their very best for its perfection, takes added meaning when compared with New York's great Cathedral of Saint John the Divine * with its glorious, colorful windows, its towers, and sculptured doorways. A trip there is promised for next time!

As a climax, a visit to the Cloisters is planned—a Treasure Trip for another day not too far distant so that the continuity will not be broken. There, each religious figure, the loving work of a medieval sculptor, stands in its niche alone, that it may make its religious and artistic message felt more deeply. There tapestries tell their stories and delight the eye in pattern and color, their gold-covered threads sparkling as they did when they decorated castle halls; as the little make-believe tapestries seemed to do in the model of the castle hall. Statues, colorful windows, tapestries, the echoing cloisters some seven hundred years old, and a beautiful old garden—all re-create that long-ago period and give it meaning. There is definite multi-sensory appeal through the eyes, through the touch—for although fingers may not actually rest upon stone drapery, flesh or gold-covered tapestry threads, the appeal to the touch is there. And there is appeal to the ears in the echo of steps on the stone floors, in the very silence of those cloistered halls. The rush and roar of the modern city are silenced, and the contemplative quiet of the thirteenth and fourteenth centuries pervades the senses.

* St. John's Cathedral—New York City, Amsterdam Avenue, at 112th Street, or any cathedral or church patterned after medieval church architecture.

EXAMPLE OF
TRIP

DISCUSSION. Following each trip another discussion includes each member of the group—eager contributions given spontaneously, comparisons of medieval life with that of today, or armored knights with our modern knights of land, sea and air. Free creative work follows in individual and group research, in writing, building, painting, modeling, weaving, slide-making—all inspired by the Treasure Trail.

At the Cloisters (New York) a guide aids a group to appreciate fully the wealth of treasures to be found there.



vii. Three-Dimensional Aids and Realia



IT IS TO BE regretted that to many people engaged in educational work the mention of visual or audio-visual aids immediately calls to mind the motion picture. The motion picture is an extremely important aid to teaching and one which helps to vitalize much of the subject matter taught in all schools. But we do need to bring into use in the classrooms of this country more three-dimensional teaching aids, more realia and models and materials which give a more lasting impression than an image flashed across a screen.

THE DIORAMA. The diorama (already defined on page 26) is one of the most helpful of visual aids when it is desirable or essential to create an illusion of reality. By means of this small group it becomes possible to set up in the classroom, scenes of life in the far corners of the earth, re-creations of scenes from the past and representations of life or countries which might otherwise be hard to describe and picture.

To date no statistical studies have been made to evaluate the effectiveness of the diorama. However, there is, and always has been, a universal appeal in the miniature which stirs imaginations and lends reality to these groups. Children accept a diorama with little questioning, and recognize that it is a representation of reality rather than reality itself.

Dioramas may or may not be lighted by means of an electric bulb set into the top of the case. One advantage in adding

THREE-DIMENSIONAL AIDS AND REALIA

illumination to the diorama is that it then becomes possible for the scene portrayed to be shown in a room darkened for motion picture or slide projection. Attention may be called to the diorama from time to time to keep in mind the group or country which is being shown in the film or slide.

The use of animation in a diorama is not desirable. Motion or animation of any kind tends to make the group seem like a toy contraption or gadget and detracts from the illusion of reality. If the aim is to teach mechanical processes it would be better to examine an actual machine or a model.

The diorama, first developed in the museums of the United States about 1912, was introduced into the schools as part of the circulating collections of materials provided by the museums. Today teachers and pupils are making dioramas as class projects, and finding them practical and valuable.

The diorama as developed by the museums, and used and made by teachers and students, usually consists of an oblong, box-like case with a curved background and a foreground on which are placed modeled figures and accessories. They are placed in front of the background in a forced perspective which makes them appear to merge into the background as real objects merge into a background of sky and scenery. This combination of curved background and forced perspective is what creates the illusion of reality.

Flat, cardboard boxes with cut-out figures set in grooves are not dioramas. They are cardboard cut-outs. If used as such, they may have value at times, but it should be remembered

that few things in this world are absolutely flat. Because it is three-dimensional, a *true* diorama gives depth and body to a scene which flat pictorial materials fail to do.

The diorama used alone, however, is not the perfect teaching aid. If specimens of clothing, household utensils, jewelry, and ceramics are grouped around it, the visual appeal is heightened. Then, through added use of motion pictures, slides, maps, and photographs, the subjects will assume reality in the minds of students.

MINIATURE STAGE-SETS. Among the "forerunners" of the diorama were miniature stage-sets, dish gardens, models of houses, gardens and temples. These are also of value as visual aids for use in classrooms. Stage-sets have long been used in English, literature, and dramatics classes. It might be well if they were used more frequently in social studies, language, and art classes. Historical episodes can be made to take on reality if acted out by small figures moved about on a miniature stage. Community organizations, groups, and governmental agencies can be set up on these same small stage-sets and made to move about as though meeting in regular session.

The sand-box provides an opportunity for early training in the use of maps. Whole communities and areas can be marked out and set up. The sand-box is particularly good when the class is one of younger children. However, the training of young men in our armed forces taught us that sand-boxes and

THREE-DIMENSIONAL
AIDS AND REALIA

models have value with older students, too. It is possible to use this material to illustrate any type of lesson where diagrams and plans are part of the work. It is easy to show how a town is planned, streets laid out, and roadways located if a sand-box is used.

For more elaborate plans and models, the table-top scene is

A miniature stage-set, complete with characters, is here used as a clever advertisement for the "live" show to be presented later.



always useful. In this instance, a village, a scene, a group of people, can be laid out on the top of a table, desk or case. A group may first be set up on a base of cardboard so that it is possible to move it from place to place. No background is provided in this instance, and the group is actually a model.

MODELS, DOLLS, COSTUMES, FURNITURE, RELICS. In addition to the table-top model, we may include models or representations of everything from locomotives to washing machines. If the original is something which moves, it is preferable to make the model move in the same way. Unless this is so, the model is only a toy or ornament and has little value as a teaching aid. A good flat picture serves to show what an object looks like, but a model should show how an object moves and is used.

Dolls, particularly those in the costumes of the different peoples of the world, help to familiarize children with the style of dress and physical appearance of people other than themselves. It is well to bear in mind that as dolls and modeled figures of human beings increase in size, they become less life-like. Dolls over eighteen inches in height often seem very artificial and do not have as great an appeal for children as smaller ones. The costumes and clothing should be as true as possible to the actual clothing worn by people whom they represent.

Dolls may either be dressed by the children of a class or they may be those purchased from commercial sources or

THREE-DIMENSIONAL AIDS AND REALIA



Dolls and relics can be displayed in classroom or hall showcases.

acquired in the course of travels to foreign countries. While the costumes made by children may not be as perfect as those made by professional doll-makers, there are many lessons to be learned from planning and making such clothing. Research is necessary to verify types of clothing worn, and skill in sewing is necessary to put the garments together. In secondary schools students of art and fashion design carry out projects of this nature. Flat prints, slides and motion pictures may all be studied first before such a project is undertaken.

It is difficult and seldom necessary to bring actual furniture into a classroom. Size and space do not warrant the use of large pieces of furniture, but scale or miniature models may be used to serve the same purpose. Unless the class is one in home-making, and actual furnished rooms are provided for the students, models of furniture serve to familiarize the

MODELS, DOLLS
COSTUMES, FURNITURE



Such an exhibit stimulates student interest in other peoples.

students with period styles.

Relics, whether they be Indian arrowheads or grandmother's wedding-shoes, always have an appeal for children. The actual handling of material from another age and people provides a learning experience hard to duplicate. It is the old story of firsthand evidence being the most important. Wherever possible, an attempt should be made to gather as many relics or artifacts as are available. An appeal to parents and adults will often reveal unsuspected sources of supply of these materials. If the specimens are irreplaceable, they can be arranged in a cabinet as a special exhibit, but an attempt should always be made to secure some articles which may be passed around and handled. As a teaching aid, an arrowhead which may be touched and felt is twice as valuable as one which must be kept behind glass.

THREE-DIMENSIONAL AIDS AND REALIA

MOUNTED NATURE SPECIMENS. The ideal way to study nature is to go on a field trip. But even where this is possible, it is desirable to have mounted specimens for detailed study in the classroom. Mounted specimens of birds, animals, reptiles, insects, rocks, may be purchased from supply houses or borrowed from museums. In addition, students should be encouraged to gather and prepare their own collections. With classes in the elementary schools this usually means bringing together miscellaneous objects and mounting them on squares of heavy cardboard for safekeeping.

In the case of students in the secondary schools today the process may be quite an elaborate and technical one. It is no novelty for a student to skin, prepare and mount birds and animals, dry and pin-mount butterflies and insects, and set up a demonstration illustrating a biological principle. This practice should be encouraged, for here the study involved in preparing the visual aid is of more value than the aid itself. We need specimens for purposes of identification but the student also needs to know something about the skeletal structure of these same specimens. This knowledge is not gained through mere visual observation. Opportunities must also be provided for analytical study of what constitutes the specimen.

LIVE ANIMALS AND PLANTS. No student, whether of elementary school or secondary school level, can be expected to appreciate and understand natural objects, plants

LIVE ANIMALS
AND PLANTS

and animals, unless some provision is made for him to have actual contact with these objects.

In the pre-school and lower grade levels living things and plants give the child a concept of growth, of life, of color, and of beauty in his own immediate world.

In the higher grades these same living, growing things be-

In the primary grades, living things and plants give the child a concept of growth, of life, of color, and of beauty in his own immediate world.



THREE-DIMENSIONAL AIDS AND REALIA

come important for still another reason. They provide a means for arousing an interest in nature study that may carry over into adult life. This is especially valuable in the case of city schools. Here students often have little or no opportunity for field study of plants and animals in their native habitats. The specimens exhibited in terrariums and aquariums should be well cared for and maintained. Students should be taught early that regular feeding and care of living specimens is absolutely essential. They must also be instructed in the proper care of plants.

If it is deemed wise to maintain a nature room, with live animals such as squirrels, mice, rabbits, raccoons, and growing plants, experienced advice should be sought as to the best means of maintaining this type of material. A nature room, where all the students in a school may come to observe the specimens and become familiar with natural objects, is always a popular place. Such a room should be considered an important part of the audio-visual program of a school.

MULTI-SENSORY APPEAL. The materials described in this chapter appeal as "multi-sensory" aids. Their value lies not alone in the visual attraction, but in the many different ways by which they can be used to arouse student interest.

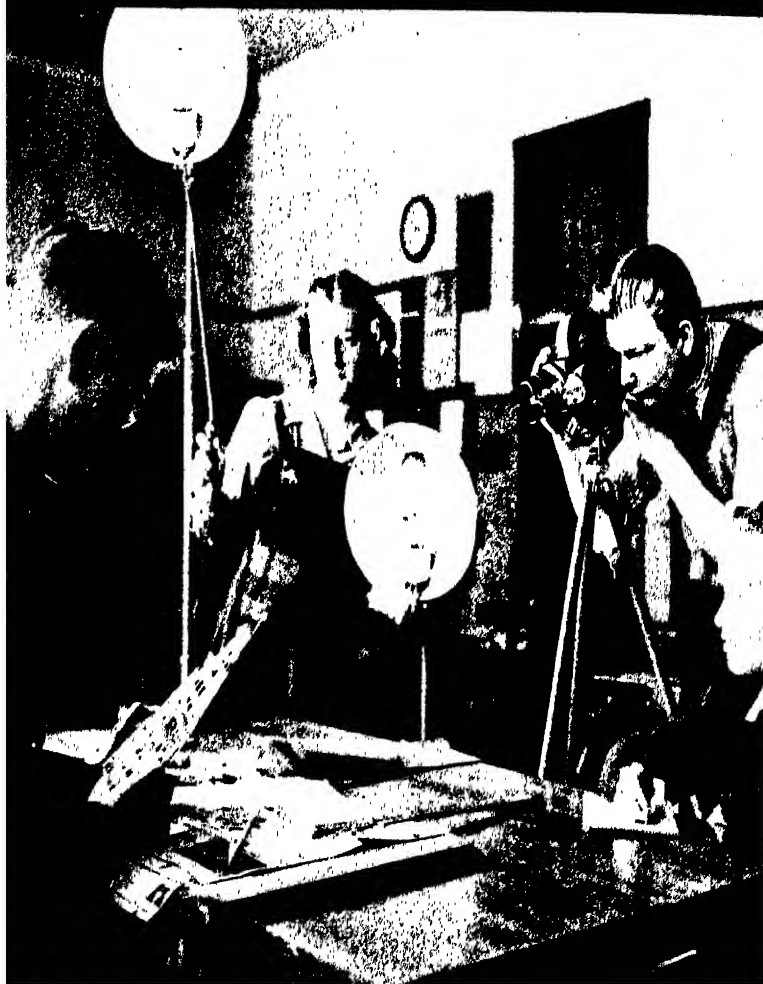
In any class there is always a group with whom the visual appeal will serve as the best method of teaching a subject. Another group can better be reached through the sense of hearing, and still others need to feel and handle materials. Some

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will gain an understanding by simply reading their textbooks.

The classroom is thus a miniature world, made up of different types of child-people. Teachers need to remember this in selecting materials for classroom use. Whatever the abilities or intellectual levels of the students with whom they are dealing, there is some aid which, properly used, will make the subject under consideration richer and more real. The best aid to use at any particular time is, therefore, the one which gives to the lesson the greatest degree of reality.

viii. Home- and School-Made Aids



MANY OF THE MOST valuable and effective teaching aids are those which have been made either by the teachers themselves, by the students, or by teachers and students working together after formal classroom time.

HOBBIES AND CLUBS. We have long been familiar with language, dramatic and social clubs as part of the extra-curricular school program. Today there is increasing evidence of the popularity of clubs devoted to the production of radio programs, the making of models, the collecting of various objects, the production of motion pictures, and craftwork. These clubs may be made the sources for the production of many of the things used in the classrooms as teaching aids. Individual students or groups of students with kindred interests should be encouraged to develop hobbies. Radio clubs, camera clubs, stamp clubs, nature clubs, all have a definite value as part of the extra-curricular activities which ought to be provided in the school program.

The greatest value to be derived from these club or hobby groups is the interest aroused in doing things. Once this interest is aroused, it becomes easy to set a boy or girl to work on a craft project or other activity. If the nature of the club activity is such that the work must be done by the group as a whole, then valuable lessons may be learned in how to work together. If the work is to be done by individuals, then each

HOME- AND SCHOOL- MADE AIDS

child may either be encouraged to work on something similar to what his fellow club members are doing, or may carry out some specific piece of work which is uniquely his own.

In either instance, manual skills are acquired, social amenities learned and observed, and the available supply of school materials increased. Even though the objects thus made eventually become the property of their student makers, their owners will proudly acquiesce when asked to lend them for school exhibits, special demonstrations or lessons. Following are some suggestions of audio-visual aids which may either be made or collected at home, or in the classroom itself, by individual students or by school club groups.

STAMPS, SOUVENIRS, RELICS. These materials are already made, but must be collected and brought together in some order before they take on value as teaching aids. The collecting of stamps is a hobby which has given satisfaction to many, old and young alike. In order to be of value as teaching aids, the collections of stamps should be arranged or grouped according to rather clearly defined subject areas. For instance, "map stamps" or "famous historical character stamps" or similar groupings are good ways of arranging collections. If a geographical grouping is desired, then perhaps all the stamps of a particular country may be brought together, and a study made to locate the places and buildings shown on the stamps.

Collections of souvenirs and relics may be grouped in much

the same way as stamps. All the different items that are gathered on visits to various places of interest in the community often form the nucleus for a school museum collection. Relics that have been unearthed by seekers for historical information about a community may well be added to this collection. People in the community are often glad to contribute relics and artifacts of early pioneer days if they are informed of how much these mean to groups of students interested in local history.

SCRAPBOOKS. The making of scrapbooks should not be allowed to become mere busy work. Neither should the scrapbooks themselves be collections of unrelated items. An entire class may participate in the making of a scrapbook, or each member of a class may make one. If a class is working on some specific unit, a scrapbook may be kept to show how the unit was planned and carried out. In this way it is possible to have a complete story, with pictures of the various units of work done during the term.

Scrapbooks may contain newspaper clippings, photographs, drawings by children, letters, essays, lists of sources contacted for materials, samples of fabrics, catalogs, timetables, maps, in fact, any collection of items that will help to present and tell a story. The layout and preparation of a scrapbook offers a good opportunity for a study of bookmaking, printing and illustration.

HOME- AND SCHOOL- MADE AIDS

LANTERN SLIDES AND PHOTOGRAPHS. It may at first seem strange to classify lantern slides and photographs together. However, when we are thinking of teaching aids that may be made in the classroom, much the same thing may be said of both of these aids.

Both the standard $3\frac{1}{4}$ x 4 inch and the small 2 x 2 inch lantern slides may be made by pupils. Let us consider first the standard slide. This may be made in almost every class from the first grade through the twelfth grade high school. It is possible to purchase excellent kits of materials to use in making lantern slides. These kits provide the teacher with everything from glass, crayons, and paints to the binding tape and labels.

The actual painting and coloring of the lantern slide offers an opportunity to develop artistic skills. Research and planning are also needed in order to know what to include in the slide picture. An excellent classroom project is the making of a set of lantern slides to illustrate the topic under consideration.

The 2 x 2 inch slides and photographs have much in common, for both necessitate the use of a camera. This is no reason to refrain from making them for school use, however, for the modern boy or girl is quite likely to be an ardent amateur photographer. Camera clubs are to be found in a majority of the high schools of the United States, and exhibits of the work done by their student members give proof of the excellent standards maintained. In many instances the work

exhibited is equal to that of adult and professional camera salons.

If it is possible to establish and equip a darkroom on the school premises, the entire photographic process from snapping the picture to developing the negative and making enlargements may be carried out either by a class or by camera club members.

In the case of the 2 x 2 inch natural color lantern slides, the film used is a special film which is sent to the manufacturer for developing and processing. It is good practice to encourage the taking of these pictures, however, for the students learn to handle film, time exposures, observe color and lighting effects. A good project to undertake is the making of a set of colored 2 x 2 slides of the school life, the student body, and the programs carried out as a part of the average school day. Other good projects include pictures taken while on nature walks, and scenes of community landmarks.

SCHOOL "MOVIES". In many junior and senior high schools today there is often a school "motion picture squad" on the scene making motion pictures whenever an event of importance takes place. Such squads may also be seen filming stories especially written and prepared to enrich particular subjects such as science experiments, demonstrations of cooking, hat-making, or interior decoration.

There should be supervision and guidance by some faculty member in these film-making activities. The making of a

HOME- AND SCHOOL- MADE AIDS

school movie involves many phases from the planning of the story, script-writing and casting, to the actual filming of the scenes. If there is no faculty member with the requisite experience to guide this work, an effort should be made to secure the assistance of a parent or resident of the community. This type of activity is best suited to the junior or senior high school level.

The English Department or the Drama Club may be called upon to help with the writing of the script. The Art Department is always a source of help for scenery and costumes. The Manual Arts Department should be asked to help in the making of props and equipment. Many groups and clubs may assist in the making of the film, but there should always be a coordinating or supervisory committee whose duty it is to follow the entire project through from beginning to end. Committee members must see to it that the actors are on hand when needed, that the script is followed, and that necessary materials are provided.

The finished film may seem slightly amateurish to some, but there is always a keener interest on the part of students in a school-made film than in a professional one. Lessons are learned in its making which might not otherwise be learned—what makes a good picture, what to include in a scene to tell a story, how to translate factual information into visual presentation.

It is also interesting to note that after some experience in making motion pictures, students become more critical in their

SCHOOL MOVIES

observation of professional films. They look for and detect details which previously went unnoticed. They become more critical of films shown in commercial theaters and begin to build up for themselves standards by which to judge all types of films.

This radio station at Brooklyn (New York) Technical High School provides a sound basis for future careers.



HOME- AND SCHOOL- MADE AIDS

RECORDINGS AND RADIO. In this modern age of sound it is often desirable to have recordings of speeches, sound effects, or musical scores to accompany school-made motion pictures. It is possible to secure for school use, not only phonographic machines on which records may be played, but also machines for the making or cutting of these records. This material is not too expensive and students may be trained to "cut" recordings of orchestral numbers and speeches.

Students should also be encouraged to make and service radio sets for school use. Here again are examples of teaching materials which may be made during the formal class period or as a club undertaking. Work of this type provides training which has a distinct vocational and professional value for students.

If a good basic sound system is installed in a school building, it can then be the duty of students to operate and direct programs using this system. Extra equipment, microphones and turntables, can be prepared and set up by students under the direction of the teacher in charge of the radio club.

Many of the radio operators and signal corps men of our army and navy gained their first experience with radio equipment while still in school when they set up an amateur receiving set for the school or for a boys' club. New improvements are constantly being made in this field and the materials available for school use have been greatly simplified. The nature of the work done makes it especially appropriate for junior and senior high school classes.

MAKING
DIORAMAS

DIORAMAS. The making of a diorama is not a difficult undertaking. Manual and artistic skills are drawn upon; research is necessary to decide what should be put in the diorama; and craftsmanship determines how it is made and put together. The actual diorama may be a simple scene illustrating some story studied in class or showing life in some country studied. As the children become more adept in handling materials, or with older classes, the diorama made may be more elaborate and finished.

High school students, during their art classes, can make dioramas for use in other courses. Craftsmanship in construction contributes to effectiveness and reality.



HOME- AND SCHOOL- MADE AIDS

Many teachers who felt that they had little or no artistic ability have been surprised at the good dioramas they were able to produce when they really tried. For some years now the American Museum of Natural History has conducted a training course in the techniques of diorama-making. Teachers who realized the visual appeal of this aid have learned to make artistic and worth-while dioramas. They, in turn, have passed this knowledge on to the children in their classes.

A diorama made with curved, cardboard background and simple, modeled figures may be made at little expense. The illusion of reality produced by these groups make them extremely valuable. Therefore, a true diorama should be constructed and not merely a box with cut-out figures. It is highly important in making groups of this type to observe this rule.

Whether the entire class cooperates in the making of one diorama, or whether several dioramas are made by small groups of children depends upon two factors: first, the amount of time which can be devoted to the construction of the diorama, and second, how many dioramas are really needed for any one class project. One diorama, well-planned and carefully constructed is better than a number of hastily put together, flimsy groups.

MODELED FIGURES. It seems almost superfluous today to stress the value of creative learning, of making things. Puppets and modeled and sculptured figures are a part of the heritage which has come down to us through the ages. Chil-

MODELED
FIGURES

dren, especially in the elementary grades, love puppet shows. There is an appeal to these figures which are made to move by strings and sticks that is hard to explain.

Hand puppets are easily made and may be little else than glove-like cloth figures which are slipped over the hand and manipulated by moving the fingers. These are readily fabricated by children in the very low grades.

A miniature group by a master modeler, Dwight Franklin. Depicted below is the purchase of Manhattan Island.



HOME- AND SCHOOL- MADE AIDS

Carved puppets require more skill in the making and are better suited to older children and to members of dramatic clubs. Many beautiful balsa wood puppets have been made by students for high school dramatic-club performances. This teaching aid should never be classified as wholly belonging in the elementary school.

Children of every age love to carve and model figures, whether the medium used is modeling clay, plasticene, wood or soap. Work of this type provides an outlet for individual artistic expression and should be encouraged. Pupils should be taken to see famous statues, the work of world-renowned artists in art museums. They should also be taken to see the beautifully mounted specimens of taxidermic art in the natural history museums. Exhibits of pupil-work provide an incentive for greater efforts in this field and should occur frequently.

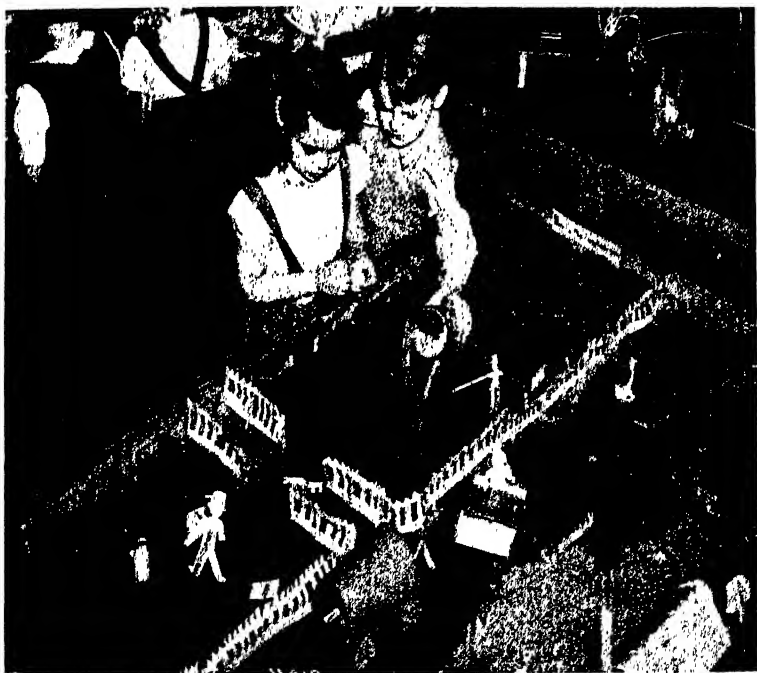
SAND-BOX SCENES, MURALS. Creative activities should include the making of many types of objects. In some instances it is wise to make sand drawings, flat table-top scenes and simple murals before attempting to make carved figures of the type already mentioned. All of these types of creative work, however, have their place in the list of classroom activities.

It is possible for groups of children to cooperate in the making of the aids under immediate consideration. This is one advantage to keep in mind when planning the program of work. Many hands may help to make the murals for a school-

MAKING MURALS

room wall or for an assembly program, such as a pageant. Again it should be remembered that the making of these materials is of value only when it contributes to the process of learning—the acquiring of skills, factual information, appreciation of arts and crafts, or when it is used as a means of getting a child to express himself. Visual aids of this type should not be made simply to fill in time or as busy work.

Truck farming on a sand table-top is as absorbing and instructive as the real thing.



HOME- AND SCHOOL-
MADE AIDS

AQUARIUMS, TERRARIUMS. For many years Ellen Eddy Shaw of the Brooklyn Botanic Gardens worked to show children how to grow and care for plants. Her methods and ideas have been carried out by many others. We have come to realize how important it is for children, especially children who live in large cities, to learn how to grow and work with living things. Pots of growing plants on the window sill of a classroom not only provide a bit of color, but they also provide an opportunity to show how things grow, how they develop. The same may be said for all types of nature study materials. A thorough foundation should be laid in elementary schools.

Will this grow in our school garden? A trip to the public botanical gardens will increase interest in the classroom terrarium.



Aquariums and terrariums should be made, stocked, and cared for by the pupils themselves under teacher supervision. Actual firsthand contact with materials of this nature give the child a greater appreciation of nature study and all that it includes. Textbooks, stories, pictures or charts are not adequate to give the child the appreciation which comes through contact with living, growing plants and animals.

The field trip to woods and fields, parks, botanical and zoological gardens and similar places is, of course, an ideal way to show living, growing specimens to children. But they should also have as much of this material as possible where they may watch, observe, and care for it themselves while studying about it. They should be encouraged to plant seeds, to collect and identify leaves, fruits, flowers, and to stock aquariums. In other words, materials of instruction should include those objects which surround us and which we should learn to know in order to be able to see this world in its entirety.

ix. Enrichment of Social Studies



THE MORE VIVID and human we can make history and geography, the more vital those areas become in the curriculum. Word pictures of historical events and personages, however excellent such descriptions may be, often lack the desired concreteness of experience. Pictures, stereopticon and kodachrome slides, filmstrips, stereographs, dioramas, dramatics on the stage, over the air and on the screen, stimulate interest in the word pictures and make them real, human, and alive.

If an objective of education is to develop the personality of the individual and fit him to live successfully and happily with other people in the world, making his definite contribution to society, surely social studies, enriched by well-selected and related audio-visual aids, are vital tools in accomplishing that objective. This area in the curriculum has to do with the social life, the thoughts, deeds, hopes and ideals of people. It deals with the social and economic problems of the past which contribute to the understanding of the conditions of the present. Through pertinent audio-visual material, boys and girls are challenged to discuss and interpret the significant factors in the life of yesterday and today.

School experiences and life experiences will be so closely related that they will be as one, reflecting the ever-changing physical and economic-social environment, and its influence upon attitude and action. There will be a more sympathetic understanding of the relationship of one human being

ENRICHMENT OF SOCIAL STUDIES

to another, of one nation to another. An example of this is the official classroom radio project of the National Education Association which has been helpful in bringing about Pan-American Unity through dramatic presentations. In addition to these are the programs which have come from the "Workshops" and "Theaters of the Air," vital in giving children greater interest in and better understanding of the world in which they live.

Through these aids there will develop a broadening of interests and human understanding, a realization of the interrelationship of the various areas in the curriculum as contributing factors toward international information which will help bring about world brotherhood. Soon television and films will be combined in telecasts which will add their potency of combined visual and auditory appeal. History and geography, vital with the personalities which humanize it, will become more alive with color and drama.

BETTER MAP TEACHING. The map has long been used by teachers of the social studies to give pupils a picture of this world in which, and on which, human beings live and work as social entities. Maps are pictures of this world—their prime purpose is to give a picture of nations and places. As pictures they are visual aids which should be so used that pupils are made aware of the fact that the social studies deal, not only with man and his tools and way of living, but also with the

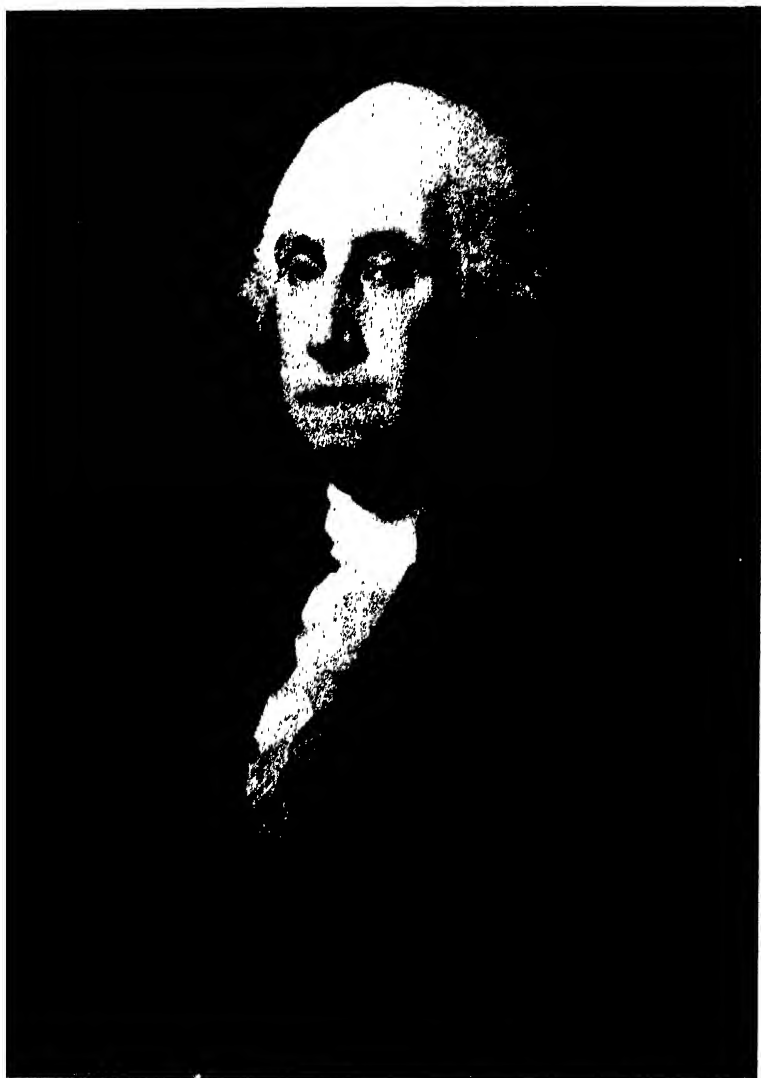
physical environment in which man works out his pattern of living.

There are many different types of maps, political, physical, population, rainfall, pictorial. There are maps which are creations of artistic skill and craftsmanship, and others which are mere combinations of lines and dots. There is a map to illustrate almost every item that might conceivably be dealt with in the social studies. Teachers should endeavor to have as many different types of maps available for use as they can secure. These maps, used as aids in visualizing this world in which we live, will help pupils to understand world conditions, and will thus help to vitalize the social studies lesson.

PAINTERS AND SCULPTORS. Painters and sculptors have done much to make social studies vivid, to enable the seeing experience, not only to illustrate, but to vitalize the word pictures of history. Painters of history, past and present, often tell their stories more convincingly than writers of history do. What written account of an historical personage can convey to us his personality and character as swiftly and convincingly as a portrait of that person which brings out the inner qualities of mind and spirit as well as the physical appearance?

Gilbert Stuart's portraits of George Washington, for example, are what most of us visualize when we think of our first great leader. Mark Twain announced that if George

ENRICHMENT OF
SOCIAL STUDIES



Washington should come back to earth and not resemble Gilbert Stuart's portraits of him, he would be denounced as an impostor! An artist who pictures an historical event has the advantage of being able to present the entire episode at the same time, whereas the historian must unfold it, page by page.

Those painters and sculptors who not only tell a story truthfully and dramatically, but with all the beauty of their vivid language, best make history live. Thus, the seeing experience not merely illustrates but vitalizes the word pictures.

With this in mind, teachers who select visual aids to enrich the social studies, whether they choose originals, slides, photographs, book illustrations, will soon distinguish between those artists of historical scenes who are interested only in telling the story, in commemorating patriotic events and personages as historical records, and those who contribute beauty to what they have to say. Let words make our historical records as such, and paintings and sculpture supplement them as vitally and beautifully as possible, for art is a cross-section of history.

MOTION PICTURES AND THE RADIO. As for motion pictures, authoritative studies have proved their effectiveness in arousing greater interest and understanding of causes, results and relationships, and of human relations. Most would

Stuart's portrait of Washington is a well-known example of effective visual presentation of the personality and character of an historical personage.

ENRICHMENT OF SOCIAL STUDIES

agree that radio is playing an important role in interpreting, humanizing and vitalizing social studies, in bringing to the boys and girls the world of many peoples and events. With television, the usefulness of radio as an audio-visual aid in curriculum enrichment will be greatly increased, reaching as it does such a vast audience in homes and schools.

TREASURE TRIPS. Actual school journeys or Treasure Trips, and imaginary ones if the real trip is impossible, to period rooms with their furniture, costumes, arts and crafts, make history especially meaningful and bring to life the people who made that history. For in considering the history of any country and period, the social life and creative expression of the people play an important part in presenting human experiences. Concrete images take the place of indefinite ones, and stimulate a better understanding of environment.

A child may read about an old fireplace and see a book illustration of it, but he will not gain the feeling of reality which comes from standing in front of a big, three-dimensional fireplace in a real room with its heavy-beamed, low ceiling, a room which actually came from a Pilgrim home. The brass warming-pan reflecting on its polished surface each passing light, the Betty-lamp, pewter dishes, desk-boxes which held the Pilgrim Bibles, andirons, colorful cushions, combine utility and beauty and reveal much of the early American way of living. Any boy or girl can people these rooms with Pilgrim

TREASURE
TRIPS

men, women and children in their simple homespun costumes, living frugally on a new, untried shore.

How quickly and vividly such a visit stimulates observation and thought, as the young discoverers follow clues, solve problems and find treasures! The actual treasures, realia, vitalize history and geography, humanize and socialize them. In connection with these trips, stereopticon and kodachrome slides carefully selected and related add to the vividness of the experience.

The Colonial rooms in the American Wing of the Metro-

A realistic miniature group by Dwight Franklin brings to life the history-book presentation of Washington's first inauguration.



ENRICHMENT OF SOCIAL STUDIES

politan Museum of Art transport boys and girls who are studying that period in history, to the actual time of George Washington and other patriots. The ballroom from a tavern in Virginia where they danced as fiddlers in the balcony played the slow and stately music of the minuet, re-creates that scene. A stereopticon slide or photograph of Howard Pyle's simple but dramatic drawing of General Washington leading his old mother through the doorway of the ballroom as Colonial and French officers and their ladies bow respectfully may be very effective. Slides, photographs and color prints of portraits of Washington by early American painters will also help produce the vividness of the experience.

The mahogany furniture of that period, inspired by the famous furniture-makers of the mother country, shows the change from the straight lines of the sturdy Pilgrim furniture to the curved lines, more beautiful wood, more decoration, greater grace and delicacy of the following century. Paul Revere silverware, simple, beautiful in form, proportion, light and shadow, and sparing of ornament, speaks well for the craftsmen's art in combining utility and beauty. Through this reality of experience the people of Colonial days step from the pages of the history book, alive and human, and take their places in their own environment.

In districts where there are no museums or historical houses with their period rooms, there should be period furniture and costumes in some of the homes. With pupil and parent help, Pilgrim, Colonial and Nineteenth century settings may be

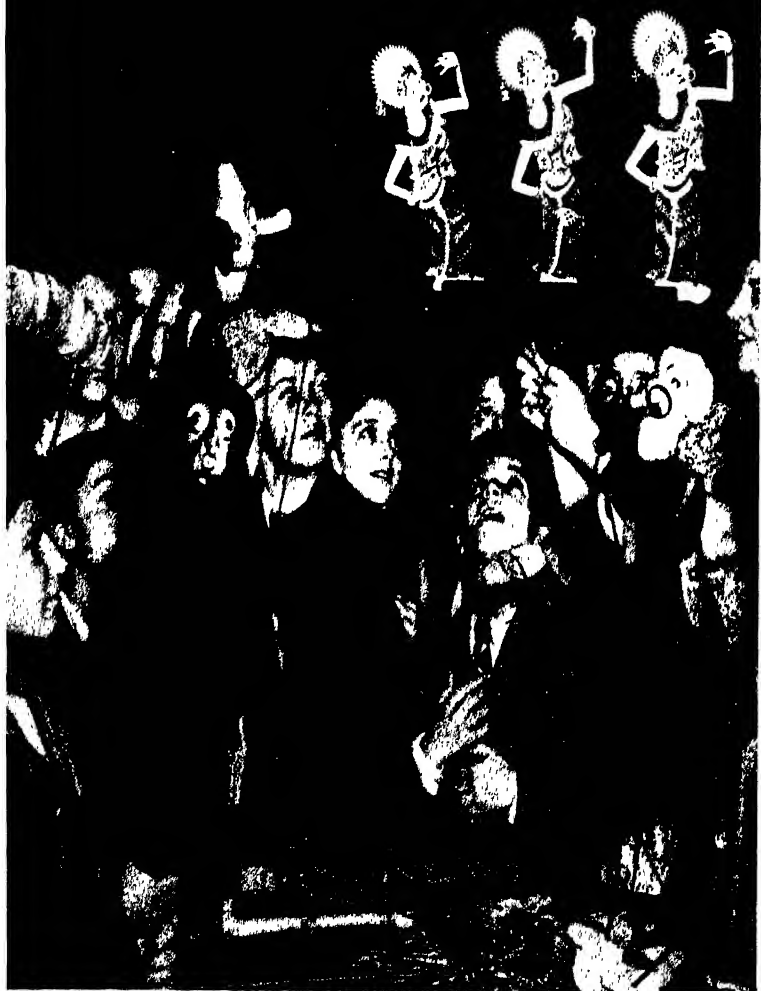
laid in the school library or classroom, and become effective as the background for an original play or plays in which historical characters "come to life".

Audio-visual aids—book illustrations, photographs, slides, filmstrips, dioramas, and films—are indispensable. Schools which have no projectors for slides, filmstrips, or films, will be able to borrow photographs, book illustrations and color plates from the geographic and travel magazines in the nearest library to supplement textbook and supplementary reading illustrations. Schools with projectors will be able to procure slides or films, or a combination, from educational sources (See chapter XVI).

"National understanding" will take on real meaning when, through audio-visual aids, children of our cities become acquainted with western cattle ranches and wheat farms, with mining districts and southern cottonfields; when children of farming, cattle and mining regions know more about life in Boston, New York, Washington, Chicago, San Francisco.

By means of this audio-visual enrichment, social studies present to children a study of life, an understanding of the social and economic problems which contribute to conditions of the past and the present. Through these audio-visual aids social studies foster a keener realization of the relation of one human being to another, of one nation to another.

x. Understanding World Culture



EDUCATORS REALIZE more than ever before that the vigorous method of teaching social studies through audio-visual materials is needed in training for democracy, and for an understanding of the interdependence of all peoples.

These aids may emphasize and interpret the common cultural languages among all nations—painting, sculpture, architecture, arts and crafts, music, the dance, and dramatics. Arts and crafts throughout the ages reveal the application of art to practical life and help interpret human desires and needs. They are the very essence of the people who produce them. When they are presented in their proper settings through audio-visual materials, they give a better understanding of the influence of environment.

The story of furniture, for example, is an important part of the history of the manners and customs of different peoples. Delicate lace, rich enamels, embroidery, pottery, glassware—all are arts widely spread throughout the whole human race revealing the social and economic life, the culture of the countries from which they come, the creative “heart” expression of the people through the craftsmen who combine utility and beauty.

In the same way music, the dance, and dramatics have grown up with the people of every land, express the feelings of their creators and arouse like emotions in the hearts of those who hear and see them. These common cultural languages demonstrate the similar interests, desires and goals of all peo-

UNDERSTANDING WORLD CULTURE

ples, the realization that we are all human beings belonging to one world, hoping for a lasting peace through world culture, justice, tolerance, the Brotherhood of Man.

Educators all over the world understand this and are making a plea for world culture. A realization through vital, human, sensory learning of the cultural heritage and creative contributions of the nations of the world will help boys and girls interpret and satisfy human desires and needs. More than that, it will help shape conduct. Pride in the achievements of the past will be fostered, intercultural understanding stimulated, and creative responses encouraged in thought and action.

Would not programs like the following, enriched by talks, stories, slides—both in black and white and in color—films, color-prints, and dioramas, help bring about this realization of world culture?

Example of Schedule



The common language of art increases understanding between races and nations. Here an Indian craftsman enthralls a young audience with ceremonial sand designs.

UNDERSTANDING AMONG NATIONS THROUGH THE COMMON LANGUAGE OF ART, MUSIC AND THE DANCE

1. UNDERSTANDING AMONG NATIONS THROUGH THEIR HANDICRAFTS. Illustrated by slides, many of them in color, and a film, *Voices in the Air*, showing the closeness of nations today.

2. DANCES OF MANY LANDS. Story of the dance, illustrated by slides from world masterpieces and film, *On With the Dance*, showing dances of various countries. Dance demonstrations by the pupils.

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3. STORIES OF GREAT BUILDERS. Story of architecture, illustrated by slides. Film, *Historic Cities of India*, stressing the Taj Mahal. Discussion by the pupils.

4. FAMOUS BUILDINGS OF THE WORLD based on program of previous week. Identification and discussion of slides by the pupils. Film, *Churches and Cathedrals*.

5. HANDICRAFT STORIES illustrated by slides and examples of weaving, enamel, jewelry, etc., brought in by the pupils.

6. MUSIC AND MUSIC STORIES. Victrola records in story followed by film, *An Optical Poem* (in color), showing the close correlation of color and music.

7. HIGHWAY OF FRIENDSHIP. Story of the Inter-American Highway, illustrated by slides, film and diorama.

8. CRAFTSMEN OF MEXICO. Story, kodachrome film, diorama, realia.

9. LIVING THE PICTURES. Slides, black and white and color, of world paintings, sculptures, etc. Impromptu tableaux by the pupils and quick sketches from memory.

10. HOW TO PAINT THE CHINESE WAY. Story, slides, diorama, and kodachrome film. Discussion by the pupils and the teacher of likenesses and differences of paintings of the East and West. Poems by children, inspired by pictures.

11. EARLY AMERICAN GLASS. The story of "Baron" Stiegel, illustrated by slides and followed by two films: *The Baron and The Rose* and *Recording Modern Sciences*, comparing the old and the new.

12. A CITY OF MANY NATIONS. Slides of Old New York and New York of Today. Recognition and discussion by the pupils, followed by film, *Up and Down New York*.

13. LIBERTY IN AMERICA. Story of Washington, Jefferson and Monroe. Slides of the three leaders and their beautiful homes. Film, in color, of their homes. Discussion of the "Birth of our Democracy and Hopes for the Future."

14. COLOR PRINTS AND THEIR STORIES. Exhibition of paintings by artists of many lands, followed by choice and discussion by the pupils.

15. MAPS OF MANY KINDS—OLD AND NEW. Film, *Airplane Changes Our World Map*. Exhibition of maps. Discussion of "Our Changing World."

16. ART IS MANY-SIDED. Talk with slides: ivories, enamels, furniture, costume, ironwork, etc. Discussion by the pupils.

17. ORIGINAL WORK BY CHILDREN. Talk by the pupils, followed by slides of painting, sculpture, arts and crafts.

18. PICTURES MADE ON WOOD BLOCKS AND METAL PLATES. Slides and film, *How to Make an Etching*.

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19. ARTISTIC ADVERTISING—EAST AND WEST. Travel and commercial posters. Place of commercial art in world of today. Discussion by children, followed by posters made by the pupils.

20. BEAUTY IN NATURE AS SEEN AND EXPRESSED BY ARTISTS. Talk, illustrated by slides and followed by film, *Nature Speaks*.

In each program,* planned to cover one week, the seven-to-eleven-year-old groups reached. There are discussions and creative contributions by the pupils and integration with the work in the classrooms.†

International workshops or exhibits in our schools correlate with and vitalize the audio-visual programs which present and interpret the cultural contributions of nations. "Treasures" no matter how small, which boys and girls of different nationali-

* Slides and color prints from The Metropolitan Museum of Art and The American Museum of Natural History. Films and dioramas from the latter Museum and films from The International Theatrical and Television Co., Inc. and The Harmon Foundation. Similar slides, films and prints may be procured from educational and commercial centers in various parts of the country. See Chapter XVI—"Where to Obtain Help."

† These Audio-Visual Enrichment Programs, and their integration with the Educational Department of the College, were sponsored by Dr. Florence Brumbaugh, Principal of the Hunter College Elementary School, Professor Philip R. V. Curoe, Chairman of the College Department of Education, and Dr. Frank T. Wilson, Coördinator. The programs for 1946, Fall, and 1947, Spring, continued "World Understanding" through visits to many countries of the world. They were sponsored by the acting Principal, Mary M. Burgess, and were conducted by Anna Curtis Chandler, Chairman of Audio-Visual Enrichment.

ties bring from home, stimulate pride in the artistic achievements of all the nations, east and west, lead to a better intercultural understanding and encourage their own aesthetic responses and desires to create in poems, songs, crayon, chalk, paint, clay and dioramas. Emphasis upon our cultural education, the common cultural languages, through these audio-visual aids which eliminate time and space, is a sure foundation for world understanding, for universal brotherhood.

Real understanding of other peoples is obtained only when we gain some knowledge of how they live, what they eat, what they wear, what they do and what they are thinking about. When you see things from neighboring countries and meet people whose heritage is just a little different from your own, you soon begin to notice similarities between their ways and yours. Programs for world understanding should strive to emphasize similarities, instead of continually stressing differences between peoples of the world.

Examples of Programs



The artistic skill of ancient Aztec sculptors is depicted in this Temple of Quetzalcoatl, Mexican deity of culture and civilization.

In 1945 and 1946, at the American Museum of Natural History, as part of the program for schools visiting the museum, there was a series of special "Weeks." These weeks were devoted to programs designed to bring a picture of the life of different peoples of the world to pupils in the New York City schools. There was a "Mexican Week" in February, 1945; a "South American Week" in April, 1945; and an "Oriental Week" in October, 1945. In each program, emphasis was placed on the clothing, food, arts and crafts of the people of

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the area. As far as possible, living models took part in the program. Classes, visiting the museum for these programs, were made to feel that they were seeing the costumes and foods and craft-work of people who were friends and neighbors. The following are brief descriptions of the programs as carried out at the museum. Programs of this type might well be adapted and carried out as part of a term project by one class, or by an entire school.

1. MEXICAN WEEK

FOOD. A demonstration by a Mexican woman of the way to make tortillas. Exhibit of stone metate for grinding of corn, bags of Mexican corn meal, tropical fruits and vegetables. (This demonstration might be given by students in home economics.)

CLOTHING. Museum staff members, dressed in native Mexican costumes, presided at the various exhibits.

ARTS AND CRAFTS. A museum staff member, in Mexican costume, engaged in actual work on silver bowls and jewelry. Exhibit of typical jade and silver jewelry from Taxco and Mexico City. Students from a class in pottery-making at New York University's division of industrial and vocational arts demonstrated how to use a potter's wheel. Specimens of pottery from Tlaquepaque, Oaxaca and Puebla were displayed. (These demonstrations might be given by students in the arts and crafts, vocational and manual training classes.)

UNDERSTANDING WORLD CULTURE

MUSIC AND DANCE. A Mexican boy and girl dressed in the colonial costumes of the particular dances, performed the jarabe and the jarango, dances dear to the hearts of all Mexicans.

MOTION PICTURES. All students visiting the museum for this special program saw the films "Arts and Crafts of Old Mexico," "Treasure Trove of Jade" and "Sky Dancers of Papantla."

PLANETARIUM. As part of the program all students went to the Hayden Planetarium where they were shown the stars they might expect to see if they lived in Mexico. (This part of the program might be carried out by means of star charts, lantern slides and pictorial demonstrations on the blackboard or with diagrams.)

2. SOUTH AND CENTRAL AMERICAN WEEK

FOOD. A demonstration of the way Bolivians cook kinoa, the native cereal grain of that country. Exhibit of native fruits and vegetables obtainable in the local market.

CLOTHING. Pupils from two elementary schools donned native costumes from Guatemala and presented a "living" fashion show for all the visiting children. The experience of wearing costumes from another country gave their wearers an appreciation for the styles and materials worn by a group of people hitherto little known to them.

ARTS AND CRAFTS. Across from this fashion show a group of silent figures kept watch. Departing slightly from the all "liv-

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ing” exhibits, the museum borrowed from one of New York’s large department stores a group which had formed a window display. The scene depicted a Peruvian market, with mannikins, in native costumes, gathered together in the market place as the natives do in that country. The costumes were brought back by Carolyn Schnurer, a New York designer, from a trip to South America during a search for inspiration for new de-

Peruvians in native costumes participate in a colorful traditional festival.



UNDERSTANDING WORLD CULTURE

signs in dresses and sportswear. Many a youthful student from the city's art classes stood before this group and made sketch after sketch adapting the odd-looking jackets and blouses to the tastes of modern young Miss America.

MOTION PICTURES; MUSIC AND DANCE. After seeing several films depicting life in South America, including one program of Julien Bryan's splendid films on Bolivia and Uruguay, the visit to South America concluded with a program of Bolivian dances by a native Bolivian.

3. ORIENTAL WEEK

FOOD. A young Chinese woman member of the museum's educational staff demonstrated how to prepare a typical Chinese dish of vegetables and pork and rice.

CLOTHING AND HOMES. An exhibit of sketches by two well-known artists showed the life and peoples of the Philippines, Sumatra, Java, Borneo and Japan. Students were able to visualize clearly the different types of homes in that section of the world and the way people live and dress.

ARTS AND CRAFTS. A demonstration in the use of the potter's wheel. Exhibit of Chinese pottery. The highlight of this program was the exhibit of Chinese, Balinese and Javanese puppets and a puppet show. Behind a shadow screen, like those set up in the towns of Java and Bali, danced beautifully carved shadow puppets so dear to these peoples. Princes and prin-

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cesses, dragons, fighting cocks, heroes and villains all moved across the screen to the great delight of eagerly watching young New Yorkers. (Pupils might well make their own puppets for a demonstration of this type.)

MOTION PICTURES. "Charm and Costume" depicted costumes of China, and excerpts from films dealt with life in the various islands of the Pacific.

All three programs were staged for a period of a week in the foyer hall of the museum which accommodated large groups of children at one time. Exhibits, similar to those described, might be set up in cases in school corridors or in the school library. Other parts of the programs such as dances or puppet-shows might be given in classrooms or in the auditorium. The cooking demonstrations might be given either in the special home economics room or as part of an assembly program. The important point to keep in mind is that a program of this type, concentrating on the life and culture of some neighbor in another part of the world, brings that neighbor closer to the pupils of your class.

xI. Enrichment of Language Arts

Example of Program



LITERATURE, AN IMPORTANT part of the curriculum area of language arts, is humanized and vitalized by audio-visual enrichment. In literature, as in social studies, there is no place today for a school program in which the main aims and objectives are techniques, skills and the mere storing away of facts. Consideration is given, instead, to the student's immediate personal enjoyment and to the lasting enrichment of his life. There must be a combination of the student's appreciation of the best in literature, the functional application of techniques and skills, a combination of the dynamic experiences of active life with the intellectual activities which formerly were of the first concern.

Today the classroom is a workshop, enabling boys and girls to gain intimate knowledge through personal, active participation in varied, everyday, related experiences—both direct and indirect. These develop in the student the power of adjustment necessary to meet the ever-changing life-experiences of today, and the power of self-guidance, self-learning, which is the goal of all learning. This is vital for successful living, especially in these days of swiftly changing social, economic and industrial patterns.

Again, there is no place today for a program of language arts which is concerned wholly with a "mass of facts," and a "dissection" of isolated masterpieces. Literature, like social studies, is a human document which should be freely, infor-

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mally, and happily discussed, enjoyed, and related to individual and group experiences in the school and outside. Through audio-visual enrichment, the student is given varied and meaningful experiences and adventures in hearing, seeing and feeling in fields of human activity and accomplishment. He relives past experiences and enjoys new ones through the sympathetic sharing of the experiences of characters in the stories made vivid and real through audio-visual aids.

This emphasis upon individual needs and choices, this personal enjoyment, does not mean that the backgrounds of prose and poetry should be neglected. It does mean, however, that they should be "introductory" to the enjoyment of the literary selection itself. Often such backgrounds are quite necessary to an understanding and appreciation of the literature they introduce, and the seeing and hearing aids play an important rôle in their presentation.

Audio-visual enrichment of the Language Arts program stimulates the imagination and quickens the emotions through a deeper appreciation of stories and their characters, and a keener understanding of dramatic episodes which the students "live" vicariously. The student's own experiences are broadened through these seeing and hearing experiences, and there is a sympathetic sharing of the many experiences presented through this audio-visual appeal. Book illustrations have long been effective in accomplishing this, and photographs, slides, filmstrips, radio and films are more so. There is a better integration of the student's own personality by orienting him to

different life situations through vivid audio-visual portrayal. Thus there is fostered in the student a greater power to think, to feel, and to accomplish.

Personalities are brought to life through this enrichment, and life-situations are vitalized. A better understanding of story or play, its setting and the personages in it, all of which without these aids may be quite outside the student's immediate environment, produces a far greater feeling of concreteness and reality. These concrete aids also help boys and girls compare and judge related experiences, and receive new ones.

THE RADIO. Through the radio which may be found in most homes and schools, many share the experiences which are so vividly portrayed. The imagination of the listener creates pictures in keeping with the audio appeal. There is, also, a strong appeal to the emotions. The dramatized story is vitalized, the characters take on form and personality, as the listener identifies himself with one of them and with the action of the plot. The dramatizations in the educational programs of our broadcasting companies should be planned to increase the interest of boys and girls in leisure time reading. Television will greatly increase this interest. Broadcasts of the School of the Air, for example, are planned to supplement classroom work by bringing to the class important world events, people, and excellent dramatic and musical talent. Thus they enlarge the horizons of boys and girls and encourage them in voluntary reading.

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The modern medium of television aids in bringing to life famous persons in history and literature.

MOTION PICTURES, DRAMATICS. The motion picture is as effective in making literary personages live as it is in bringing to life famous persons in history. Many times the motion picture is the most potent of all the audio-visual aids in bringing this about, when the story is not distorted as it sometimes is for box-office appeal. The dramatization of literary subjects is valuable because of continuity in vivid unfolding of plot, convincingly human characters, examples of voice and diction, and enrichment of vocabulary. Dramatizations of some of the stories recommended in the school curriculum are available in the 16 mm. films. The fee for their use is prohibitive for many smaller schools but parent committees are often organized to take care of that problem. Some of the films deal with stories by Shakespeare, Dickens, Kipling, Longfellow, Mark Twain and Washington Irving.

SELECTION AND COMBINATION OF AIDS.

There are other situations when the combination of the motion picture with carefully selected stereopticon or kodachrome slides, followed by a Treasure Trip, is what the teacher feels is required to make story, book, or play yield to boys and girls its full meaning. The teacher must decide which form of audio-visual material, or which combination, is most effective. Personal selection is important, for only the teacher who is familiar with the material to be presented, and the educational aims to be accomplished, can effectively select which aids shall be used.

Example of Language Program



A Shakespearean drama unfolds on an Elizabethan stage.

TO SHAKESPEARE'S PLAY WITH QUEEN BESS AND HER COURTIER'S

This program has an introduction to be illustrated with stereopticon slides which may be borrowed from the school service lending collections of museums, from collections made by the boards of education of various cities and towns, and from libraries in state and city institutions. They may be rented from educational and commercial companies.

If slides are not available, and the school has an opaque projector, book illustrations, photographs, and postcards illustra-

tive of the period and story may be used most effectively.

If neither slide * nor opaque projector is available, an exhibition of mounted photographs and postcards, made available to classrooms before the program, will be helpful.

These illustrations make the introduction vivid, with the combination of visual and auditory appeal, and often that of touch when the illustrations seem to be three-dimensional.

The story should be told rather than read, when possible, and presented vividly in costume if a suitable costume can be procured. The parts should be portrayed with human and dramatic appeal.

Any possible Treasure Trip to see models, paintings, armor, tapestries of that period, doubles the effectiveness of the presentation.

INTRODUCTION "LEADING INTO" THE STORY

SLIDE—

Architecture, English, Renaissance. London before the Great Fire—Old London Bridge Model (London Museum)

The sixteenth century, Queen Elizabeth's century, was one of greatness. In some ways, it was the most significant in English history, and has influenced the world. It marked the change from the Middle Ages to the modern world. Competition entered work and the individual stepped from the crowd. England was supreme. Queen Elizabeth's brave Sea

* The stereopticon slides listed here are from the Lending Collections, Metropolitan Museum of Art.

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Kings had most effectively "sing'd King Philip's beard." King Philip of Spain found that he could no longer boast that he was Master of the Seas. Queen Elizabeth's Sea Kings—Sir Francis Drake, Sir Walter Raleigh, Sir John Hawkins, had made her Queen of the Seas. The great Spanish Armada, which King Philip had boasted was invincible, was conquered. England ruled supreme on both land and sea.

SLIDE—

*Prints, Engravings, Zundt. Portrait of Sir Francis Drake
(London, British Museum)*

SLIDE—

*Prints, Engravings, Leu. Portrait of Sir Walter Raleigh
(London, British Museum)*

SLIDE—

Prints, Engravings, Pine, J. S. Spanish Armada

It was an age of great men, not only brave sailors, soldiers, and gallant courtiers, but fine writers, poets, actors, and artists.

SLIDE—

Architecture, English, Renaissance. Penshurst Castle

Mingled with the points of gables and the perpendicular lines of tall chimneys reminiscent of the Middle Ages, were

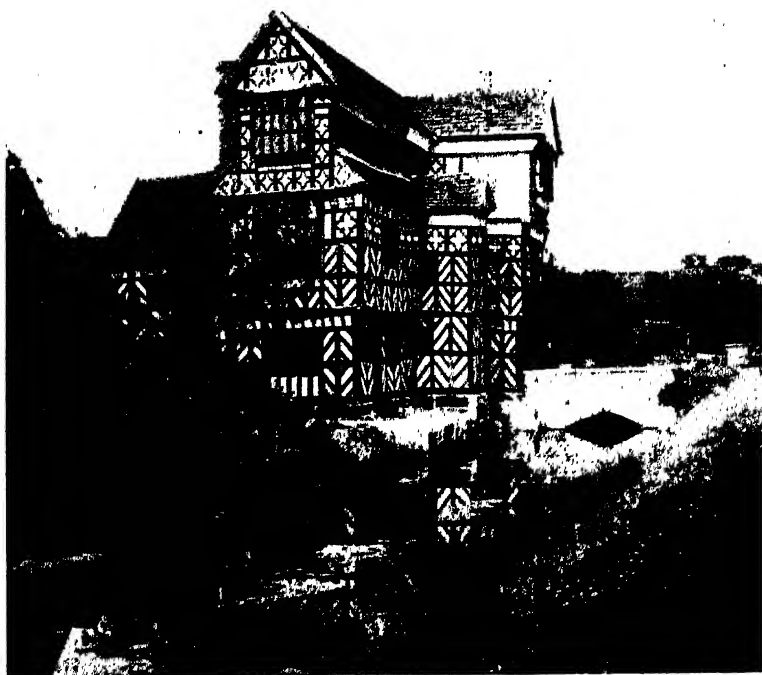
SLIDE—

*Manners and Customs, Domestic, English, XVI Century.
Elizabethan Staircase*

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PROGRAM

the square-headed windows and doorways of the new style in architecture. Classic designs, borrowed from the Greeks and the Romans, were introduced into the wood-carving. Slender columns and patterned capitals, scroll and leaf designs which had come in with the new style from Italy, the Renaissance, were in use. There was a riot of carving done with exquisite skill.

Moreton Old Hall—a surviving example of English Renaissance architecture.



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The great hall, formerly with a roof of its own, was incorporated as a part of the house which was often shaped like the capital letter E in honor of Elizabeth, with many rooms built around two inner courts.

SLIDE—

Architecture, English, Renaissance. Pitchford Hall, Exterior

SLIDE—

Manners and Customs, Domestic, English, XVI Century. An Elizabethan Family in Front of Their House

The windows, symmetrically arranged, made it difficult in the estimation of some of the folk of the time—Lord Bacon among them—to keep away from the drafts or the sun! Oriel windows were introduced, like bow windows, built out from the wall and resting on brackets.

SLIDE—

Architecture, English, Renaissance. Hardwick Hall, Interior, Staircase

Costumes reflected the changes in architecture, the pointed forms giving way to rounded, though some of the old pointed style was still used. The circular stone staircases changed to the beautifully carved wooden ones which were more accommodating to the long, wide, stiff skirts, the ungainly farthingales! Bodices were stiff and pointed, embroidered with jewels.

The ruffs, of Spanish origin, grew larger and stiffer, until finally large, fan-like collars developed.

SLIDE—

Painting, Geeraerts, M. Portrait of Elizabeth, Hardwick Hall

The armor of the time followed the pointed doublet, and the engraved designs imitated the gold and silver braid which decorated the doublets.

SLIDE—

Arms—Armor, English, XVI Century Suit of Armor which belonged to Sir James Scudamore, Gentleman, usher at the Court of Queen Elizabeth (New York City, Metropolitan Museum of Art)

The foremost man of the time was one William Shakespeare, the greatest writer of plays of that time and of all times.

SLIDE—

Painting, Burbage, Richard. Portrait of Shakespeare (London, National Gallery)

In quaint and gentle Stratford-town, on the banks of the river Avon, young Will Shakespeare had a good background for the beauties of his later writing.

SLIDE—

Architecture, English, Renaissance. Stratford

Through a garden of rich, purple flowers in the midst of cool

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Shakespeare's house in Stratford-on-Avon. Note the many small-paned windows.

green, we may still enter Ann Hathaway's thatched cottage in Shottery, not far away.

SLIDE—

Architecture, English, Renaissance. Shottery, Ann Hathaway's Cottage

Shakespeare's two-storied house made of wooden beams, its roof thatched, its gables steep, its black beams on the outside checkering the walls into squares and triangles, dormer windows adding to its charm, is again an example of the mingling of the old and the new.

SLIDE—

Architecture, English, Renaissance. Henley Street, Shakespeare House

But shall we not visit, first, a theater of this time?

SLIDE—

Drawing, De Witt. Swan Theatre, 1593, Interior

It is summer, and a bright flag is waving from the turret to announce that the play is about to begin at three o'clock in the afternoon.

SLIDE—

Architecture, English, Renaissance. Fortune Theatre, London

In a moment, three trumpet-blasts will proclaim that the performance is starting. So, let us hasten to enter the circular

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building, its roof the cloudless blue sky except for the stage, passages and galleries. In the summer theater, the pit, or yard, where many people are gathering, is always open to the sky.

Everywhere there are gay colors, for the Londoners have come in holiday array, and are whiling away the time before the play begins by eating nuts and apples, and by drinking ale.

In front of us is the stage, coming well out into the pit, and open between the columns at the sides so that the more favored spectators in the boxes may see all that is taking place. There is no curtain, no scenery. The playgoers of Queen Elizabeth's time had much better imaginations than we have!

SLIDE—

*Manners and Customs, Domestic, English. An Elizabethan
"Playe" House*

The name of the play is hung out on a placard, and the prologue appears, robed in black velvet. With many bows he tells what is going to take place, begging for the good will of the audience. Right before our eyes, the "properties," such as rocks, branches of trees, tables, chairs, are put in place, as one scene follows another without pause.

The stage, with the aid of the vivid imaginations of the spectators, is the throne-room of a palace, dense woods, or the waves of the sea, the actors moving from one "scene" to another. The upper part of the stage in the rear is useful in balcony scenes such as in *Romeo and Juliet*. The actors, dressed in the costumes of their own day, even though they may be

representing a far earlier time, enter through the curtains at the rear of the stage. All parts are played by men or boys. The placard has just been put up informing the audience that they are looking upon a forest.

Now that we have had a glimpse of what is taking place, we will steal away, and return with members of the royal court, when Her Majesty appears!

SLIDE—

Painting, Geeraerts, M. Visit of Queen Elizabeth to Blackfriars. (Sherborne Castle)

S T O R Y

“Yo! Ho! And the Spanish Main,
Sang the salt sea waves of old.
‘The Sea Kings bold for Queen and gold
Ploughed our turbulent plain.’
Yo! Ho! for good Queen Bess
They braved the Spanish Main.

SLIDE—

Painting, Heere, Lucas de. Portrait of Queen Elizabeth. (New Haven, Yale University)

“The whip of the gale as it lashes the sail,
In the storm as it rises again.
Yo! Ho! These Sea Kings bold,
Brave and daring and strong;
With cutlasses long they righted the wrong—
Yo! Ho! And the Spanish Main!”

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Thus sang a bronzed sailor, a broad felt hat set jauntily upon his rough black hair, big golden ear-rings gleaming in the afternoon's sun, and scarlet trousers reaching barely to his bronzed knees.

SLIDE—

Painting, Millais. Boyhood of Walter Raleigh (London, National Gallery)

"Up with you, now!" he commanded the two lads who had been drinking in each word of his sea stories. "Shake the sand from your clothes, and we'll be on our way. 'Tis so long since I have walked on land, I have not my 'land legs' yet. Busy I have been with helping Captain Drake, Sir Francis as now he will be called since he has been knighted in return for his services by no other than Her Majesty, good Queen Bess. 'The Dragon' with his little ships swept down upon King Philip's castle-like galleons and drove them from our shores. Queen

SLIDE—

Painting, Lawrence. Knighting of Sir Walter Raleigh. (London, House of Parliament)

Bess now rules, the sovereign of the sea as well as of the land.

SLIDE—

Painting, Zuccaro, Attributed to. Portrait of Queen Elizabeth. (London)

And I, lads, am right glad I was in the thick of it, though I would have returned before this to Slough, a prettier village

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never was, had I not shipped again with Sir Francis. But now here I am, my pockets bulging with fine silks for thy mother, Master Ned, a necklace for young Prue, and a box of rare wood for our old grandam.” *(Lights—As story continues)*

There was great rejoicing that night in the little village of Slough at the return of one who had been gone from them so

Queen Elizabeth and her courtiers live again in this impersonation developed by elementary school pupils after hearing a story of Queen Bess and the England of her time.



long and who had helped to rid their land and its surrounding seas of the dreaded Spanish foe. Most of the villagers, old and young, gathered at the Royal Arms, where there was much rejoicing and merrymaking as he who had sailed with the famed hero, Francis Drake, told his adventures.

Dick, Ned, and Prudence sat by themselves, apart, in a dusky corner which the candle-light of the old tavern but poorly lighted. But they could hear just as well, with their ears attuned to every adventure which had befallen "The Dragon's" ship, "The Golden Hind," and those who so bravely adventured in it.

Dick and Prue were very proud of their brother. In their eyes he was just as great a hero as "The Dragon" himself, every bit. Ned was proud of him, too, but he was more proud of his father, an actor in the Queen's Players who performed their plays in the different villages and towns through which they passed. They hoped to receive the honor of playing in London before the Queen at Her Majesty's request. It was enough to make any boy proud, to have a father in that troupe. Ned was very glad they happened to be in Slough on the night when Dick's sailor brother came home.

"I'd like to have been there when Jack Drake, page to the famous captain who now is not only Admiral of Her Majesty's fleet but her honored Knight, first caught sight of the Spanish Treasure Ship they were looking for! He won the golden chain promised by his master!" Thus spoke young Mistress Prue.

"And I, when they sailed upon the vast unknown waters of

the South Sea, or when they looked out upon both seas. Most of all I'd like to have been there when they sailed around the world. What could be more wonderful, Ned, than to be the first Englishman to sail around this world on which we live?" breathed Dick rapturously.

Ned nodded. Then he looked very earnest as he said rather low, for it was a strange thing to be saying on that night of all nights with Dick's sailor brother just returned from his adventures, "If I could have my choice, Dick, I would be a player like my Father, and act my plays before our Queen and her court. That's what I would do! And," here Ned hesitated a bit, for he was about to tell something which had been in his inmost heart for some time but which never before had he told even to his player-father, his greatest chum.

"I would one day meet Master Will Shakespeare of Stratford who has won fame for himself in London Town by writing verses and turning them into plays which bring him great praise from Her Majesty, our Queen. My father says he is the most talked-of man in London, and all words are to his praise. And my Father knows. He has seen this Will Shakespeare many a time, and once watched him play before the Queen. She dropped her glove near him while walking across the stage to her place of honor. He kept his part of king in the play, picked up her glove, and handed it to her with a bow which greatly pleased her. Such beautiful thoughts he puts into words, such as you never dreamed. Here are some of them, the talk of London Town, methinks.

'How sweet the moonlight sleeps upon this bank!
Here will we sit, and let the sounds of music
Creep in our ears; soft stillness and the night
Become the touches of sweet harmony.
Sit, Jessica. Look, how the floor of heaven
Is thick inlaid with patines of bright gold;

.
Come, ho, and wake Diana with a hymn;
.
And draw her home with music.'*

"'Tis beautiful," breathed Prue, starry-eyed. "I, too, would like to meet this writer-actor, Master Will Shakespeare. Wouldn't you, Dick?"

Dick nodded, rather vague and bewildered. Fancy being able to say all those high sounding words! He admitted to himself that they were beautiful, but in his opinion they would have been more beautiful if they had only been about the sea! "Yo! Ho! And the Spanish Main!" his sailor brother had been singing. He could better understand those words.

"Thus Sir Francis and the other brave Sea Kings proved there is a Queen of the seas as well as a King," the returned seaman was boasting, and that with right good cause. "Where now are the galleons of Spain? God save the fair and brave Elizabeth, our Queen, Mistress over land and sea!"

All glasses were right quickly and loyally raised, and a rousing cheer filled the little tavern so completely given over to

* From Shakespeare's "The Merchant of Venice."

merrymaking. But before the sailor could go on with his tales which held spellbound his wide-eyed, eager listeners, a courtier clad in velvet cape and broad plumed hat, his ruff lace-edged, thrust open the door. "In the Queen's name!" he cried. "What with all this merrymaking within there was no hearing my knocking without. Her Majesty is here! On journey to the castle of a lord not far distant, the wheel of her royal carriage was lost just outside of Slough. Make room for Her Majestyl!"

Such a commotion filled the little tavern of the Royal Arms! Such excitement shook the village of Slough! Torches sent forth their flares, brightening the quaint little streets bordered by gabled houses set in the midst of gardens blooming with purple flowers. Trumpets rent the stillness, as the royal procession drew near. Courtiers in gold-embroidered velvet, fine pleated ruffs, wide plumed hats, gold-hilted swords by their sides, gave orders for the Queen's entertainment. One, a tall noble, drew a velvet cape more closely around the Queen as he rode by her side, carefully guiding her horse. Gaily he chattered with Her Majesty, whose blue eyes sparkled and whose auburn hair, jewel decorated, twinkled with changing lights as she peered this way and that. Truly, this adventure was much to her liking.

"'Tis Sir Water Raleigh!" exclaimed the excited Ned who had run to his father's side. "My father says so! He is the one they were telling of the other night. He is the hero I was telling you of but the other day, my sweet Prue, the knight who

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so gallantly served his Queen. Dost remember?"

"Nay, and if I do, good lad, tell me once again ere they come inside, an' thou wilt."

"He, too, has always loved the sea, my good friend Prue," began Ned as they watched the gorgeous procession draw up at the tavern door. "Was not Master Walter, Sir Walter now,

The versatile Elizabethan stage balcony was not limited in use to *Romeo and Juliet*. Frequently it was a stage in itself.



a boy living close to the sea in Devon? He heard all the brave tales of Sir John Hawkins and Sir Francis Drake who adventured upon the strange seas, and longed to be with them. So he manned a ship to help defeat the dread Spanish foe. More than that he sent colonies to the New World across the great Western Ocean for his Queen. One of them is named Virginia in honor of Her Majesty, the Virgin Queen. By her own hand he was knighted even as thy brother's master, Sir Francis Drake of the 'Golden Hind'. And this is the way it came about.

"One showery day, when clouds seemed full eager to chase the sun away, the Queen went walking from her palace. All her wise counsellors and courtiers, her gay and splendid court ladies, her cavaliers, followed her. Jewels gleamed from her red hair as they do on this night. Mayhap, my good Dick, some of these very jewels were in the Spanish ships your bold seaman brother helped 'The Dragon' to capture. No doubt her great collar of cobwebby lace rose high above her head as it does now. Jewels gleamed over almost every inch of her, even upon her little shoes as we can plainly see in the torch light.

"A heavy shower had left a large muddy place directly in her path, though the sun, reappearing, had caused it to sparkle.

" 'My shoes will take ill to the mud,' laughed the Queen, so they tell the tale, and she held up her wide jewelled skirt, not liking to venture. 'And your pretty feet as well,' said a courtier with a deep bow, hoping, methinks, to receive favor from the Queen because of his gallant speech. But Master Raleigh, no

dealer in pretty words without gallant deeds, sprang forward on the instant and spread his embroidered velvet cape over the muddy place before his Queen.

"'Well hast thou served thy Queen,' declared Her Majesty, much pleased as she tripped lightly across the velvet bridge, 'I shall reward thy courtesy for thou art truly a gallant knight.'

"Sir Walter she made him and she likes full well to keep him by her side, making him Captain of the Queen's Guard, Lord Lieutenant of Cornwall, and Vice Admiral of Devon! Not only is Sir Walter brave and bold, as brave as Sir Francis, but he has a ready wit and is a maker of pretty verses which help Her Majesty pass pleasantly many an hour. But look you, Dick and sweet Prue, such jealous glances rest upon him from the other courtiers. Methinks trouble will be brewing in the court for 'tis said that the head of the Queen's favorite is never long safe. But come, let us go again to our corner where we can see clearly what takes place, for Her Majesty is about to enter our tavern. Truly, Slough and the Royal Arms will long be remembered as the place where her Majesty, Queen Bess, stopped one night when the wheel from her royal carriage was lost."

It was a most wonderful evening. There was the sparkle of jewels, the flashing of swords in the torch and candle light, witty sayings and even hearty laughter for the Queen was in the best of humor over affairs both at home and abroad. Was she not the acknowledged mistress of the land and the sea? Had she not bold Sea Kings who had filled her coffers from the

Spanish treasure ships and protected her from her arch enemy, King Philip of Spain? What other sovereign had a more brilliant court, more loyal subjects? One toast followed another, and the tavern-master quite outdid himself in the matter of cooking. Savory odors filled the tavern room and brought a pang of hunger for a taste of the roasts and the pasties even to those who had supped before.

Ned's cup of happiness was filled to overflowing. Her Majesty had called for the Queen's Players and blessed her good fortune that they were in Slough. She applauded the dancing, the music, the acting, the poem which Ned's father recited hailing her as Queen of the Seas and the Land. Bells jingled, pipes played, drums throbbed, feet twinkled, nymphs danced amidst the green, weaving garlands of flowers. When the Goddess of Beauty appeared and with most pleasing words handed her sceptre of beauty to Queen Bess, the applause could have been heard as far away as Maidenhead.

Then it was that Her Majesty sent for the leader, the chief actor, Ned's father. Ned's heart was near to bursting with pride when he heard her say, "Thou dost please me well, sirrah, and I would have thee and thy company perform before me in London. Nay, more, I would have thee meet Master Will Shakespeare, the best poet and play-writer in all England. Master Shakespeare is an actor as well, and mayhap it would please thee and thy company to see one of his new plays such as hold the court and their Queen spellbound. He is with the Lord Chamberlain's Company in London now,

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writing plays with his ready pen and acting in them, too. I will recommend thee to him for this company. Thou hast done so well, sirrah, that mayhap thou wilt one day be made 'Master of the Revels' at court. There thy gift would have full play in preparing masques, plays, and pageants. Await on me in London a week hence."

"To think on it!" exclaimed Prue, "thy dream has really come true. Thou wilt see Master Will Shakespeare. Pray remember, Ned, all about the playhouse and the actors and the costumes that they wear. Dick and I will be watching for thy safe return, an' thou tell us not all about London Town it will go hard with thee, sirrah!"

Dick was glad that his playfellow was to be so honored but he would have liked to go along, too. "Never you mind, my sweet duck, you shall go with me to London when next I go to meet my master on the 'Golden Hind,'" comforted his brother.

Ned was all eyes and ears in London. Narrow streets packed close with wooden houses and shops displaying their beckoning wares, Saint Paul's towering majestic and dignified towards the sky, London Bridge supported by great arches, and a multitude of strange boats in the River Thames, all fascinated him.

"Dick would like to be looking at them," thought Ned, a pang of homesickness shaking him even in the midst of such absorbing sights as the city offered. There were most wonderful big houses, so different from the little gabled cottages in

Slough, some of them built in the shape of the letter E in honor of Elizabeth, the Queen, with ever so many square-topped windows one right underneath the other, all seeming to peer down at him.

"Methinks it must be too warm in the hot sunshine within," muttered Ned, "and overly cold when the winter winds are blowing."

The great event at last arrived, though it had seemed to the eager Ned as if it never would. They had actually entered the big circular theater on the bankside of the river. A confused mass of gay colors met Ned's eyes, and a medley of sound, laughter, talking, music, drummed upon his ears. Everyone was merry, out for a good time. From the pit of the house Ned looked up at the blue of the mid-afternoon sky, at the flag waving from the turret to tell all folk that there would be a performance that afternoon. He glanced at the stage. "The Venetian Comedy", he read from the placard. That sounded good. He was glad that there would be some laughter in it. That was why he liked his father's plays and pageants. There were few tears in them, and Ned thought, as did Prue and Dick, that laughter was far better than tears.

Ned felt rather sorry for all the people standing in the pit of the house before the stage, as he took the seat offered him by his father's side in one of the boxes to the left of the stage. But they seemed to be having a right jolly time—chatting, drinking, and eating. He wouldn't mind a nut or two, himself. All around him in the boxes, to the right of the stage as well

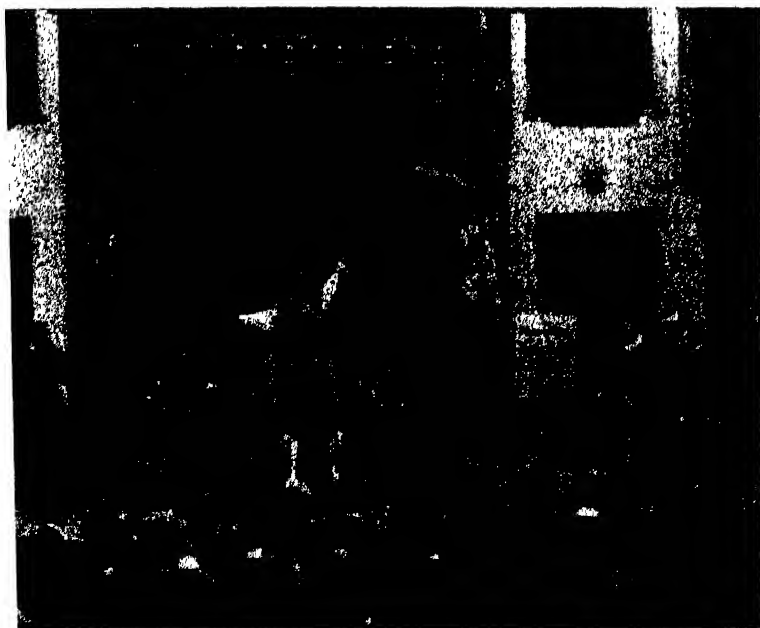
ENRICHMENT OF
LANGUAGE ARTS

as the left, were such gorgeous ladies and splendid cavaliers that Ned was sure they were of the court.

"Watch for Her Majesty," whispered his father. "She will be here soon, lad. What think ye, my sweet Ned, she said to me this very day? That we may see the great Master Will Shakespeare after his play is through. 'Tis an honor, mind you, lad, that your father and you are receiving!"

Ned pressed his father's hand and sat as close as he could

Prologue and placard draw the attention of those in the pit to the presentation of a Shakespearean play.



to his side. Mayhap one day his own actor-father would be upon that very stage, doing his part before the Queen. Aye, that was a thought to juggle with!

Of a sudden there was a great commotion. "Surely the Queen is coming!" thought Ned. But 'twas only a pickpocket caught and tied to a post on the stage for all eyes to gaze at and for folk to pelt with apples if they were good marksmen.

A sudden blare of trumpets and cries of "Her Majesty, Queen of Merry England!" proclaimed that she was being led to her seat of honor upon the platform, itself. Ned recognized some of the courtiers he had seen that night at the Royal Arms. There was one who had not been at the Queen's side then but who claimed royal attention now. He was good to look upon, his eyes bright and sparkling, his chin ending in the same little pointed beard that Sir Walter and Sir Francis and all the courtiers boasted. He seemed to be bubbling over with energy. A velvet cape hung well back upon his shoulders over his embroidered doublet, and a crisply pleated ruff framed his eager face. His plumed hat was held carelessly in one hand while with the other he called Her Majesty's attention to certain things of interest upon the stage.

The play progressed. Ned sat breathless in his chair, no longer in London Town but with the characters upon the stage, in the colorful city of Venice.

Hark! There were the very words his father had taught him and he loved so well, words which had always made beautiful pictures as he heard his father say them.

'How sweet the moonlight sleeps upon this bank!
Here will we sit, and let the sounds of music
Creep in our ears; soft stillness and the night
Become the touches of sweet harmony.'

Now he was seeing enacted the very play of Master Shakespeare from which those words came! Ned was almost overwhelmed in his delight, so much so that he did not see his father rise and bow as some one approached him. Nor did he notice his father's delighted face or hear the whispered words, until he heard his own name spoken.

"Master Ned," a kind strange voice was saying, "your father tells me you came here on purpose to see me. I am honored, sweet lad. Grow up with this same love of the stage with which your good father has endowed thee, and mayhap you will be acting in one of my plays before the Queen as your good father will soon be doing."

Ned gasped. 'Twas the kind-faced courtier who had been seated by her Majesty. He had come to their box on purpose to speak to them. Truly Queen Bess was very kind to send him, for it must be Master Will Shakespeare, himself! Ned could only bow and look up at the great writer and actor with worshipful eyes.

"One day you must come to Stratford, lad, and see my son Hammet of about your own age, and my sweet mouse, Judith. A good time I warrant you would all have in the fields on both sides of the river, all velvety green and blossoming with

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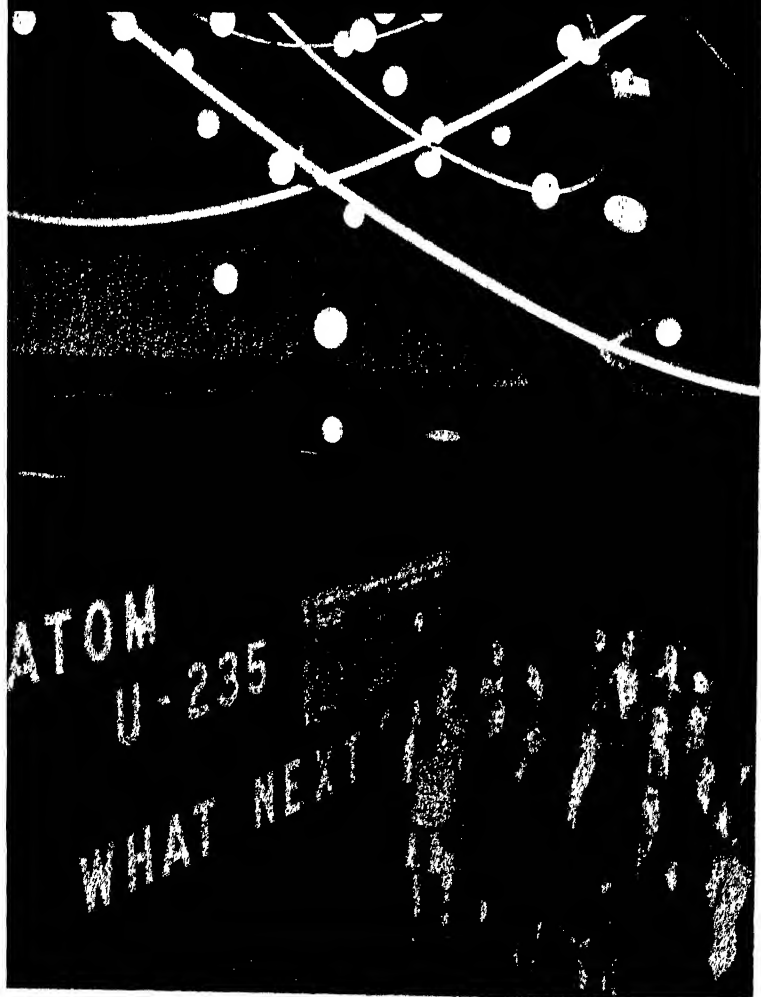
EXAMPLE OF
PROGRAM

posies. On a May Day you shall come with your father when the Queen's Players will entertain us with dances and masques. Good Master Player, I shall see you and your sweet lad again for soon you will be with me in the Lord Chamberlain's Company. Fare-you-well, now, good friends. Her Majesty is waiting."

It seemed to Ned as if he could not wait to get back to Slough, happy as he had been in London Town. So much he had to tell. To think that his father was to receive a coat-of-arms and be able to have "Gentleman" put after his name! How he would talk of his meeting with Master Will Shakespeare! Dick and Prue would see him, too, and enjoy his plays when they moved to London Town.

xii. Enrichment of the Sciences

Examples of Programs



IT IS MOST ESSENTIAL today that the sciences be made a living part of every school curriculum. World events, news items, current films, radio programs, all include an increasing number of references to work done in the field of science, and preparation for citizenship in the world demands a knowledge of basic scientific information.

Even before World War II called upon the talents and skills of scientists to work for mankind in general, the increasing importance of science in our daily life had become apparent. Whereas the student of yesterday had little need to draw upon an understanding of chemistry, biology, physics, electronics or radio theory, the student of today accepts these subjects and makes them a part of his everyday life. It is desirable that he do this, for the modern world is being built upon products conceived and developed in the laboratories. This subject area in the curriculum should very definitely be made real to students of all grades through utilization of audio-visual aids.

Probably one reason that less emphasis was formerly placed upon the importance of the sciences in the elementary and high school curricula was due to the fact that these subjects were considered to be of value only for the student who contemplated a career as a chemist, a doctor, an engineer, or a professional research worker.

Today, every child accepts radio as part of the equipment

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of living and wants to know the principles underlying the construction and operation of a radio set. The airplane is an accepted means of modern transportation, and your school boy or girl wants to know what keeps a plane aloft and in flight. Plastic materials are everyday commodities, but the boy and girl of today wants to know how they are prepared and how they should be used. It is essential that the modern school child be equipped with sufficient fundamental, basic, scientific information to understand this world in which he lives. This understanding must include a general knowledge of the sciences as well as of the social studies, arts, languages and crafts.

Methods and techniques for the presentation of the science subjects need vitalizing. Too much emphasis has been placed on the learning of formulas and not enough emphasis placed on practical adaptations of these same formulas. The effective utilization of audio-visual teaching materials is necessary if laboratory experiments are to be interpreted in terms of human situations. The mathematical formulas which produce energy are of no value if the energy produced is not of use to man in his environment.

Many of the audio-visual aids used in the classroom are the result of the application of modern scientific principles. Therefore, these same aids can be made of value in vitalizing a study of these same principles. A simple explanation of the principles of optics and their relation to a motion picture projector will often prove valuable as a means of increasing appreciation

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of modern equipment. This same procedure may be applied to any of the various machines used in this work. An understanding and an appreciation of the rôle played by equipment should be one aim if these aids are to be made part of the school program.

A lesson in physics will become real to the student who has

Visual aids are very important in science studies. Here a high school biology student in Tomball, Texas, examines microbes with a microscope.



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seen a film depicting the processing of uranium; a lesson in modern chemistry will take on meaning to the student who has seen a film showing the rôle of plastics in the modern world; a chemical formula which has been a mere compilation of symbols and numbers may suddenly become clear to the visually-minded student when he sees this same formula illustrated on a filmstrip; the processing of steel takes on new life and vigor to the student who has heard a recording of the sounds in a steel mill. Scientific experimentation and study have given us so many of the materials which we use in the classroom. We should give back to the study of these sciences the products which they have helped to create.

Stories and accounts of the lives and works of world-famous scientists should be made a part of a study of any one of the sciences. The reading of the life of George Washington Carver or Marie Curie provides the student with information which enables him to form a mental picture of these persons and their places in the world of science. Then, if motion pictures, filmstrips, lantern slides or a combination of these aids, dealing with the same subjects and people, are shown to him, the visual medium enables him to see the living personalities. He sees the people and events of the world of science as he has seen the people and events of history, literature and art.

It is important that the work of individual scientists be made real to the child, in order that he gain an appreciation not only of these individuals but also of the part that he himself may take if he chooses to work in these same fields.

MOTION PICTURES
SLIDES, FILMSTRIPS

The use of audio-visual aids in the teaching of the sciences will help to break down rigid subject barriers which have long existed. For instance, the motion picture just mentioned dealing with the life of Carver will show how he drew upon a knowledge of chemistry, biology, physics and other subjects. The film showing how modern plastic materials are made will illustrate how chemistry and physics are combined. Still another film dealing with the pasteurization of milk may be used to illustrate principles of biology, chemistry and scientific dairying. It is to be hoped that many films will soon be made to demonstrate how the factual information learned in the different sciences can all help to produce new materials, new products, new foods, new methods of agriculture. The factual content taught in one branch of the sciences is often the basis for further study in another science. The use of many types of audio-visual aids will help emphasize this connection. Teachers should try to select and use audio-visual aids which will bring out this point and at the same time clarify and vitalize the subject matter itself so that it takes on real value to the child.

MOTION PICTURES, LANTERN SLIDES AND FILMSTRIPS. As has been pointed out in the preceding section, the motion picture can be made a very effective aid in the teaching of any of the sciences. The lantern slide and filmstrip should also be included among the aids used in teaching these same subjects. In the case of both the lantern slide

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and the filmstrip, the image or picture shown may be held on the screen for a longer period than is possible with the motion picture. This is a distinct advantage in science classes, where the pupil must learn recognition of objects, such as the parts of a flower, anatomical structure, or the parts of a dynamo or engine. Furthermore, the teacher herself controls the speed at which lantern slides or filmstrips are changed or moved. This adds to their value in these classes, for detailed study of figures and diagrams is necessary.

Pupil-made motion pictures, lantern slides and filmstrips are especially valuable for use in science classes. Principles learned in chemistry and physics classes become of practical value in the making of these aids. Moreover, it is well for teachers to make up sets of slides showing diagrams, formulas, equations and processes. These slides, shown on the screen while some experiment is in process, will help to keep before the pupils a picture of the principles underlying whatever experiment they are performing. These principles might otherwise be temporarily forgotten in the thrill of performing an actual experiment.

RADIO AND TELEVISION. Radio and television are both outstanding examples of how science has contributed to modern life. They may be effectively used in two ways in the school program. In the first instance, factual information concerning the construction and operation of both radio and television sets may constitute the subject matter of a lesson. In

the second instance radio and television may be the media through which additional information on many subjects is brought to the children. It should be as much a part of the classroom procedure for science classes to listen to the broadcasting of scientific meetings and programs as for social studies classes to listen to political meetings. As television becomes more universally available, it may well be possible for science classes to observe demonstrations and become familiar with the techniques of famous scientists.

The winner of the Soap Box Derby is televised for telecasting to youthful fans—thus increasing the interest of budding engineers.



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EXPERIMENTS AND DEMONSTRATIONS. The demonstration-experiment technique has long been considered a regular feature in the teaching of the sciences. Such demonstrations, however, should not become mere routine. Science is bringing new materials, new foods, new drugs, new products into our lives. Examples of these contributions should be brought to class wherever possible (or lantern slides or films illustrating these new materials should be shown). Dioramas, flat prints, and any of the other audio-visual aids should be used in the science classes to stimulate interest in the subject under immediate discussion. It is important to show the interdependence of the various sciences and the other subjects included in the school curriculum. We should use the same types of teaching aids that are used in the other classes, or we will continue to lean upon memorization and experimentation as the only methods to use in teaching the sciences.

SCHOOL JOURNEYS AND TREASURE TRIPS. If the treasure trip may be said to make objects and peoples come alive for the social studies, it is equally true that it does the same for the sciences. A trip to a glass-making factory, a foundry, a testing laboratory, will clothe an otherwise drab and routine science lesson with life and reality. The student who has watched the process of pasteurizing milk will have a clear picture of what actually takes place in a modern dairy. The sciences deal with concrete, definite subject material. Therefore, any teaching aid which helps to make a subject

concrete and definite for the pupil should be utilized. Whenever possible science classes should be taken to museums, factories, laboratories, and other places where they may observe actual scientific specimens and processes.

SELECTION AND COMBINATION OF AIDS. It is impossible to lay down any rules or formulas for the most effective audio-visual aids to be used in teaching any of the sciences. Modern science is cooperating to make the modern world. Thus we can only repeat that the sensory teaching aid or combination of aids which best illustrates and vitalizes the subject under consideration is the best aid to use for that subject. Science teachers should beware of establishing routine practices and procedures to illustrate basic principles. Basic principles are likely to be employed in new combinations—and the alert science teacher will use the aids which most clearly show these changes and adaptations.

Examples of Programs



Egbert, the mechanical man at the Franklin Institute in Philadelphia, greets feminine admirers.

It has frequently been said that the social studies benefited most from the use of audio-visual materials, and that most of the materials now available for classroom use were appropriate only for this subject area. It is true that this was the situa-

tion until quite recently. But the current interest of youth of school age in radio, television, electronics, and the other sciences has made it necessary to provide materials which will be of value in teaching these subjects in the classroom.

At the Franklin Institute in Philadelphia the staff has outlined a number of programs, which although planned as radio programs, are particularly well suited for classroom use even when the radio section of the program is omitted. To paraphrase the report of the Director of Education at the Institute,* the radio program was directed toward the elementary schools, adopting the theme "Science Is Fun." It was broadcast every Monday afternoon at 2:15 p.m. over Station WFIL for the purpose of dramatizing events of science and highlighting the offerings at the museum and planetarium. Egbert, the famous mechanical man, a feature of the Institute, was brought to life in the broadcasts and children took part in the program. A teachers' manual, containing synopses, suggested activities, vocabularies and booklists, was sent to every teacher of grades three to six in Philadelphia and the surrounding area. An evaluation committee visited classrooms to watch pupil reactions to the programs and to make suggestions to teachers. A similar series is now being prepared for the high school level. Films listed in the programs are available only to the schools of Phila-

* The project was suggested by Miss Gertrude Golden, District Superintendent, Philadelphia Public Schools. It was carried out by a steering committee under the chairmanship of Armand Spitz, Director of Education, The Franklin Institute, with Miss Ruth Weir Miller, Radio Assistant, Philadelphia Public Schools, in charge of the project.

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delphia, but if other teachers desire to use them, information as to where to secure them may be obtained by writing to the Department of Education, The Franklin Institute, Philadelphia, Pennsylvania. Transcriptions of the programs were also made for use in Philadelphia schools, and it is to be hoped that these transcriptions will soon be available to schools in other parts of the country.

UNIT—TRANSPORTATION

THE WHEEL

THE STORY. Man first was limited in his knowledge of the world to that portion which he could see, but he soon began to travel away from home on foot in search of food and for other purposes. The development of methods of carrying himself, his family and his possessions marks the beginning of the science of transportation. The invention of the wheel was the first step which made possible a traveling civilization and brought about a sharing of the cultures of many parts of the world. Egbert will tell about the construction of the Pyramids with the moving of weights on rollers, and will trace the wheel up to the present time.

LET'S LEARN NEW WORDS

Horseless buggy	Pharaoh	tomb	Khufu	pyramid
	(Fay-roh)		(Koo-foo)	

SET THE SCENE

Talk about all kinds of vehicles on wheels, past and present.

Create a bulletin board display showing progress of transportation on wheels.

Let class contribute what they know about early use of wheels. (Indians, Chinese, etc.)

Study about Egypt and the Pyramids.

Discuss modern use of "rollers" to move heavy machinery, etc.

Make a class scrapbook (or individual ones) showing progress of transportation.

Reports on early cars, trains, carts, chariots, etc.

LET'S LISTEN FOR

1. How the roller lightened the labor for men.
2. Why the building of the Pyramids was such slow work.
3. What animals were used for early transportation.
4. What kind of transportation poor people used.
5. Why coaches were uncomfortable.

WHAT EVERY CHILD WILL WANT TO KNOW

QUESTION: What are some familiar uses of the wheel in addition to moving vehicles?

ANSWER: Steering wheel, pulley, fishing reel, gears in clocks and motors.

TRY IT YOURSELF: EXPERIMENT

Build a miniature "sand table" pyramid under construction with blocks on rollers—partially built pyramids, etc.

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Experiment with round objects such as pencils, rolling books over the desk, to show the difference between sliding and rolling.

Try dragging across the floor a box weighted with books. Then slip wheels or rollers under the box, and try again.

LET'S READ

Harter, Helen. *How We Travel*. Follett Publishing Co. Chicago, Ill. Pp. 31. Pictures particularly applicable to use of the wheel in transportation.

Petersham. *Story of the Wheel*. John C. Winston Co., Philadelphia.

LET'S SEE A MOVING PICTURE

Development of Transportation. 11 min. sound film. Shows the types of natural barriers which for ages compelled isolation of various peoples. Describes the contribution of the steam locomotive, the gasoline engine, and the development of the railway systems in the United States. Depicts man's conquest of sea and air.

Transportation, Part I. 15 min. silent film. Shows the Egyptian sled and dog sled, early car, prairie schooner, stage coach, "Tom Thumb," "De Witt Clinton," modern steam locomotive, electric trains, roadbeds, tunnels and grades.

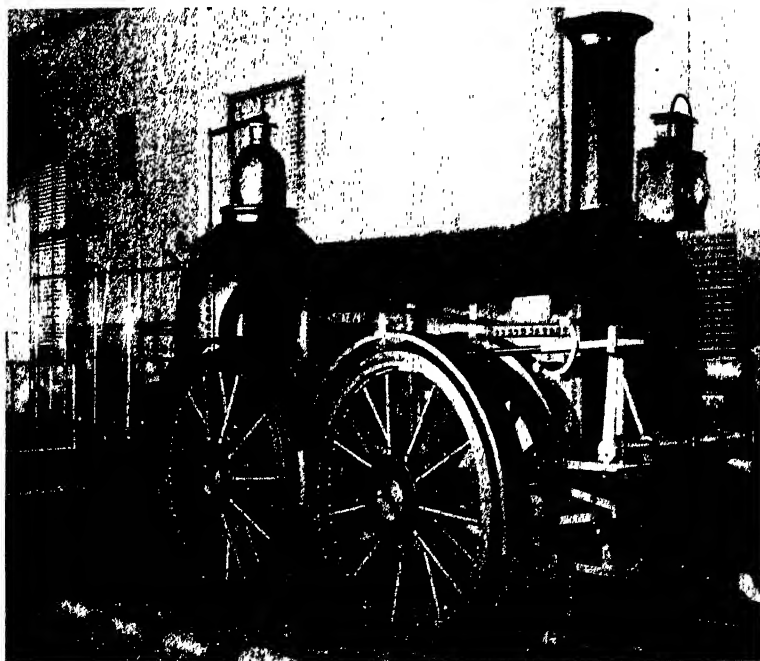
Transportation, Part II. 15 min. silent film. Man as beast of burden, evolution of the wheel, use of animals, early and later

EXAMPLE OF
PROGRAM

steam trains, subways, elevated, early automobile, New York street scenes, and air transportation.

Transportation, The Story of. 12 min. silent film. Shows Indian drags, mule trains, stage coaches, horse-drawn cars, diagrams of principle of early steam engines, development of the cylinder and sliding valve, wood-burning river boat, and the principle of the gas engine.

The *Rocket*, an historical locomotive important in the early development of railroad transportation.



ENRICHMENT OF
SCIENCES

UNIT—COMMUNICATION

IT'S IN THE AIR

THE STORY. This is the story of the greatest system of mass communication that has ever been devised. Egbert will tell in dramatic form some of the steps which carried communication from the point where it was necessary to have wires running from place to place, to a literal broadcasting of messages in all directions and *without wires*. The first experiments were called wireless telegraphy, and messages were sent by means of sparks. The invention of the vacuum tube made it possible to transmit and receive music and voice, and the new device came to be known as the wireless telephone or the radiophone—from which we get the word radio.

SUGGESTED MATERIALS FOR CLASSROOM DEMONSTRATION

If possible, obtain an old crystal set and ear phones.

Bring in vacuum tubes from radio (may be discarded tubes, which will be satisfactory to show the different elements).

Science or social studies textbook of vintage of 1915 explaining about "wireless" and another of 1925 telling about the birth of broadcasting.

Modern "ads" for radio or television sets.

VOCABULARY	volume	rectification	wave-length
transmitter	audio-frequency	kilocycle	aerial
microphone	radio-frequency	selectivity	ground
amplifier	modulation	impulses	vacuum tube

EXAMPLE OF
PROGRAM

SUGGESTED ACTIVITIES BEFORE THE BROADCAST

How many different stations can you tune in on your radio set when the volume is lowest?

How many can you tune in when the volume is highest? Do you have a tone control on your radio? Listen to a program and observe what difference this adjustment makes. How many tubes are in your radio?

Have a "mock" broadcast in the classroom.

WHAT TO LISTEN FOR

How men first tried to send radio signals through space.

How your voice is turned into "radio" waves and then back into "sound" waves again; or what happens between the microphone and the classroom.

The steps in the development from "spark" signals to modern radio broadcasting.

SUGGESTED ACTIVITIES AFTER THE BROADCAST

What is the scientific explanation of "560" on your dial?

Report on different techniques used on the radio—e.g. drama, interview, monologues, quizzes, variety show, etc.

Ask any student who has broadcast to report on his experiences.

Ask for reports of visits to studios.

Arrange for a visit to WFIL to see a broadcast of "Science is Fun"; or a visit to WFIL to see studios and a sound effects demonstration.

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Have students tell of their own experiments with sound effects.
Organize a Radio Club if there is not one in the school.

BIBLIOGRAPHY

Peet, Creighton. *All About Broadcasting*. Alfred A. Knopf, N. Y., 1942. Pp. 67. Written for children. Well illustrated.

Floherty, John J. *On the Air*. The Junior Literary Guild and Doubleday, Doran & Co., Inc., 1937. Pp. 99. Another well illustrated book on the subject.

A school Radio Club practices for a broadcast. Students appearing on a radio program gain a deeper appreciation of this vital means of communication.



RELATED FILMS

Network Broadcasting. 12 min. sound film. Shows how modern network radio programs are sent over the air and the part telephone circuits play in making them possible. May be used to depict the number of employment opportunities available in radio.

News in the Air. 20 min. sound film. Describes the radio as a means of communication and dissemination of news. Employs the Panay incident as a typical situation from the time the reporter swims from the sinking vessel until the news is broadcast over a major network.

On the Air. 28 min. sound film. Describes how radio programs are written, built, rehearsed, timed and produced. A technical section describes "what makes radio work."

Television. 9 min. sound film. Briefly describes the parts of the television receiver and transmitter. Shows the televised broadcast of a horse race and the use of the mobile television transmitter unit. Shots of a televised studio broadcast.

The two programs cited are merely examples of what may be done today to enrich the sciences by utilizing many different materials of instruction. There is no reason why similar programs cannot be planned for use in chemistry, biology, general science, physics, physiology and hygiene. Lantern slides, illustrating equipment, apparatus and diagrams, may all be made by pupils and used as part of the demonstrations. Filmstrips

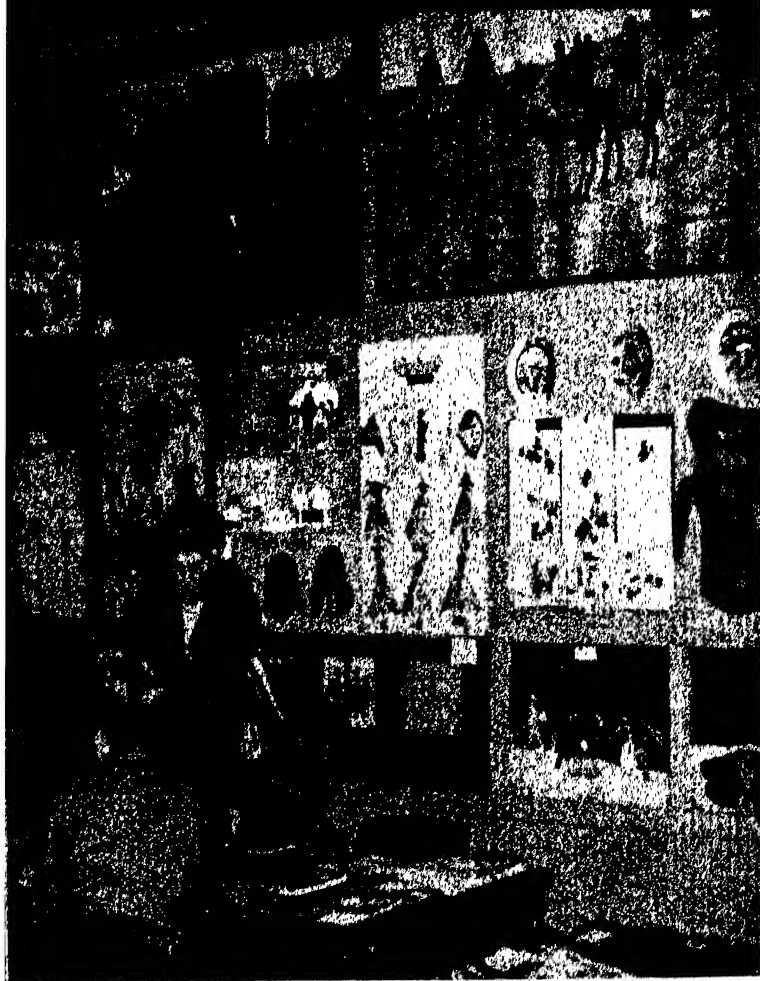
ENRICHMENT OF SCIENCES

dealing with the lives and contributions to science of eminent scientists are available and should be used as part of the class study.

Although the programs cited call attention to materials to be seen in a great museum in one large city, programs of this type may be used in any schoolroom today. In place of a field trip to a museum, the teacher may substitute an exhibit of materials borrowed from a museum or other educational institution. This method brings the museums and educational institutions into the classroom when it is not practical for the class to make actual field trips to them. Such materials should be brought into the classroom, made a part of classroom equipment, and used to vitalize and enrich discussion periods and laboratory experiments.



XIII. Planning the Audio-Visual Program



AUDIO-VISUAL ENRICHMENT programs are accepted today as a valuable method of teaching and integrating the various areas in the curriculum. Learning wholly through the ears by means of the spoken word has always been recognized, although it has often resulted in "verbalism," a mere hearing of words, a memorizing of informative facts without any real understanding and appreciation of their meaning. When boys and girls "see" as well as "hear" the subject content, then the words become meaningful.

Audio-visual enrichment programs should be carefully prepared with a full understanding of the content and aim of each aid, the reasons for its use and combination with other aids. For each visual and audio-visual aid has a particular usefulness and advantage which is often intensified by combination with other aids. The teacher who plans the programs should be skilled in the selection and combination of the various aids which best interpret the meaning of the areas presented. Often, and especially with younger children, there is the need of multi-sensory appeal through eyes, ears and fingers. Stereopticon slides might fully enrich the content of one lesson, kodachrome slides might be the best selection for another—an art program for example—whereas a combination of slides, films, color prints, habitat groups, models, dioramas and school trips might be essential for enrichment programs integrating various areas in the curriculum.

PLANNING THE AUDIO-VISUAL PROGRAM

It is for the teacher to decide which aids and combinations of aids are to be used with the objective of changing the curriculum from stereotyped, formal, verbal learning in unrelated areas, to vital, human, sensory and happy learning in related areas. Through this method, opportunity is given for individual thinking, feeling and doing—instead of limiting learning to the intellectual activities alone which were formerly of the first concern.

INTEGRATION WITH THE CURRICULUM. Since no subject in the curriculum should be taught as an area by itself, but rather in relation to other areas, integrated programs are important in presenting this relationship. Visual and audio-visual aids increase the interest which children have in these various areas and bring home to them their close relationship in what otherwise might be abstract, indefinite experiences. Audio-visual aids substitute concrete, definite experiences which enrich and humanize learning, build up broader backgrounds, and make the content of each area meaningful, connecting it with real-life.

All will agree that literature should not be “dissected” but humanized. By means of audio-visual aids, children are enabled to “live” past experiences and enjoy new ones through the sympathetic sharing of the experiences of the characters in stories and personalities in history and science. Brain and hand, feeling and will, become active in vital experiences through audio-visual enrichment, which not only shows the

relation of various areas in the curriculum one to another, but the contribution each has to offer to the integrated knowledge which will enrich the lives of our boys and girls. Critical thinking, individual feeling and dynamic doing are stimulated. The desire to see original material in proper settings is aroused, enabling the real experience to become the learning situation, and thus providing functional learning.

Through these programs, interest which has been created in one area is kindled, also, in related areas. The value of such integrated programs, with appeal through seeing, hearing, touching, creating, is self-evident. Such presentations enrich and humanize learning. Audio-visual programs in which children take an active part in research and creative expression stimulate an even greater understanding of the various areas which they integrate and enrich.

BUDGET. The extent to which the school audio-visual enrichment program may be developed depends upon the school budget, donations from parent organizations, and returns from school entertainments, "fairs," etc.

Many schools are without these facilities and must base their programs upon free materials which are available. Fortunately there are both educational and commercial films without fees—such as government films and those which present, often in a vivid, educational manner, commercial products. There are stereopticon slides, black and white and color prints which may be borrowed, even habitat groups, dioramas and

PLANNING THE AUDIO-VISUAL PROGRAM

unit materials.* These aids enable programs to be presented although lack of funds may limit their scope and hinder the realization of ideals.

Some schools are fortunate in receiving financial help from their Parent Associations. Hunter College Elementary School in New York City is unique since it not only has the budget for audio-visual enrichment programs provided by its Parent Association, but also receives the services of an active and effective parent committee. The members of this Audio-Visual Enrichment Committee procure the materials, help in operating machines and arrange bulletin boards. A teacher committee also cooperates with the Chairman of Audio-Visual Enrichment.

CLASSROOM PREPARATION. Teaching programs in most subjects are carried out in classrooms. It should be kept in mind that the classroom is the frame or setting for a program. This setting should be properly arranged if good results are to be achieved. Good films, slides, pictures or maps are of little help if they are poorly and improperly used and displayed in the classroom.

The first item to be checked is equipment for projection. If it is necessary to project in a darkened room, proper window curtains or shades should be provided, so that maximum brilliance and clearness are achieved. Projector and screen should be set up and checked before the class convenes. Last-minute

* See Chapter XVI, "Where to Obtain Help."

CLASSROOM PREPARATION

adjustments distract the attention of the children and also take time that might better be spent in presentation of the lesson. If anything is wrong with the projector, or if repairs are necessary, they should be attended to before the class period in which the projector is to be used.

If flat prints, dolls, objects, maps or other aids are to be used, they should be set out on shelves or bulletin-display boards before the lesson starts. All materials that are to be used for a particular lesson should be taken out of cupboards and so placed that they are accessible when needed. Time spent in hurried searching for some item is class time wasted.

A special room devoted to audio-visual aids is highly desirable. A teacher should be in charge to advise and assist in the presentation and procurement of aids needed in the classrooms.



PLANNING THE
AUDIO-VISUAL PROGRAM

TEACHING AIDS. Wherever possible, teaching aids should be displayed in the classroom for a long enough period of time for the children to become familiar with them. They should also be displayed in an attractive arrangement. Modern advertising display techniques might well be utilized in order to catch and hold the attention of pupils. The amount of material on display at any one time depends upon how much material is needed and also upon how much the teacher feels it wise to display for any one lesson. This is a matter which varies according to the subject, the amount of material available, the need for supplementary teaching aids, the quality of material available, and the intelligence level of the class. One picture, effectively displayed, may be better at one time than a series of pictures. At another time a series of related pictures may be needed to illustrate and clarify some topic that has baffled and dismayed another group.

Even though a school has a center for the storage, care and distribution of teaching aids, each teacher should have materials in her own room which are directly related to the subject she teaches. This collection, which may consist of pictures, maps, clippings, posters or pamphlets, will enable her to have an ever-ready source of supplementary material upon which to draw. Then, when additional aids, such as motion pictures, lantern slides, filmstrips, dolls, etc., are needed, they may be secured from the general school collection. If the children bring to school clippings and other material, both the classroom collection and pupil interest will be increased.

THE AUDIO-VISUAL ROOM. The question of whether or not it is advisable to set aside a separate room for the audio-visual program is one which depends upon the school layout and construction, the school budget and the teaching program. The ideal situation would be to have each classroom provided with equipment for the showing of motion pictures and slides, and sufficient cupboard space to have the other aids kept in readiness. This, however, involves an expenditure of money not possible for the average school. The best, practical situation would be to have an audio-visual room on each floor of the school building.

One practical solution to the problem is to have one room in which all projection equipment is set up and kept in readiness for use at all times, and to take classes to this room when audio-visual aids are to be used. If this plan is followed, one teacher should be in charge of the room and a definite time schedule arranged for its use. If the teacher assigned to be in charge of the audio-visual room is also to plan the audio-visual program for classes using the facilities of the room, she should not be expected to carry a full teaching schedule of other subjects. The successful planning and carrying out of an effective audio-visual enrichment program is a full-time assignment in itself.

The room selected should have good acoustical properties in order that sound motion pictures and recordings may be used to full advantage. Poor sound effects are as much a hindrance to good teaching as poor films. The room should be centrally located and easily accessible to classes from all parts of

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the building. The windows should be equipped with heavy curtains or shades so that the room may be darkened sufficiently to insure good projection. A roll screen mounted on the wall, or a standing screen should be in readiness at all times.

The projector to be used, whether motion picture, filmstrip, or lantern slide, should be set up and focused before the class arrives. If the class teacher is to be the projectionist, she should have the films or slides in order for insertion in the machine. When sound materials are to be used, the sound speaker should be connected. If a student projectionist or the audio-visual aid teacher is to be projectionist, these same details should be checked before each class arrives.

A portable projector for 2 x 2 inch slides and a microphone connected to a loudspeaker are convenient if the auditorium is not equipped with a projection booth.



The audio-visual room should be large enough to accommodate at least two classes. It is often wise to show motion pictures to more than one class at a time. When a guest speaker is present, several classes may be brought together for the program. For good audio-visual enrichment programs, the room devoted to these programs should be carefully planned and equipped. Then the program will be carried out in such a way that it becomes part of the whole teaching schedule, instead of being an afterthought.

AUDIO-VISUAL PROGRAMS IN THE AUDITORIUM. Every school auditorium should be equipped with facilities for showing any and all of the types of materials already mentioned. Assembly programs should be enriched by the showing of motion pictures; guest speakers should be asked to give illustrated talks; students should be encouraged to use these aids in presenting their own speeches or plays.

One thing to be avoided, however, is the use of the auditorium as the audio-visual room. If this plan is followed, it is likely to mean that motion pictures are shown to large groups of students, regardless of whether or not the pictures are applicable to the needs of all or only part of the group. Students soon come to regard such motion picture showings merely as entertainment. When this occurs, no great gain will come from the use of even the very best teaching films, and mediocre films will be of still less value.

The well-planned assembly program should be one part of

PLANNING THE AUDIO-VISUAL PROGRAM

the complete audio-visual enrichment program. If a class has been successful in the preparation of a good play, puppet show or radio-script, these will often prove of benefit to the whole school when given as an assembly presentation. But the auditorium is not the place for the successful carrying out of audio-visual programs planned for individual class work.

EQUIPMENT FOR DISPLAY. The audio-visual room should be provided with sufficient space and equipment for proper display of the different types of teaching aids. Modern bulletin boards may be purchased, or made in the school shops. It is essential that such display boards be provided for the arrangement of flat pictures, maps and prints. Materials of this type often lose their effectiveness if poorly displayed or crowded into a small area. It is sometimes a good plan to have blackboard and display board sections alternating around two sides of the room. This makes it possible to show pictorial materials while still providing adequate space for blackboard work.

Display cabinets with glass doors should be provided for objects which must be kept locked up or behind glass. A good type of cabinet is one with glass-doored shelves in the upper section and storage cupboard space in the lower section. Open shelf space should also be provided for materials which may safely be displayed in this way and for books, pictures, pottery and other objects. Whatever the type of cabinet, ample space

should be provided so that many types of materials may be displayed and made available to the students.

SPECIAL EXHIBITIONS. The ingenious audio-visual teacher will try to change the exhibits on display frequently enough to keep student interest alive. Special exhibitions should be planned for the different holiday periods, for special lessons, for open-school week, for parent-teacher association meetings, and for many other occasions. These exhibits should not always be arranged by the same group of students, but all students should be encouraged to assist in the preparation and setting up of such displays. Students should be encouraged to bring in material from home for temporary exhibits; friends should be invited to lend materials they have collected on trips to foreign countries; the entire teaching staff of the school should be invited to contribute objects for special exhibits; hobby and craft exhibits should be held, both for students and teachers. The arrangement of a special exhibit will often be found the means of arousing interest in some topic which would otherwise have made a mere routine lesson.

xiv. Creative Achievements



CREATIVE ACHIEVEMENTS cannot be measured by laboratory tests. They are individual, often intangible, and usually progressive.

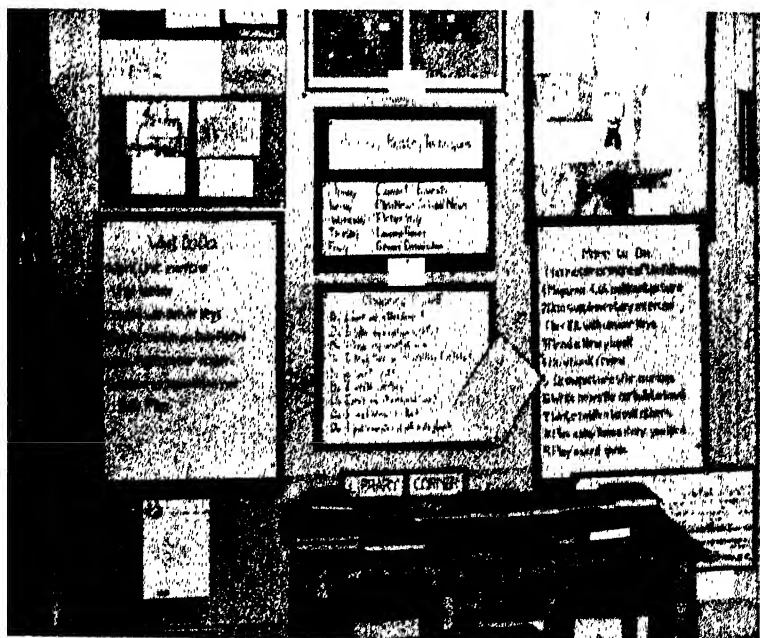
Perhaps the understanding and appreciation of the wonders of the world in science and art, the comprehension of *world* rather than national history and culture, the vision of world citizenship of tomorrow in a world where time and space have been conquered, are not the least of these results. Audio-visual aids can accomplish economically, effectively, and happily what only world travel can in relation to education on a world basis. They enable our boys and girls to participate in what seems to them actual reality of experience, so vital may be the use of these aids by those who realize their power and know how to make use of it.

History ceases to be lessons of dates, names, events and places to be learned and soon forgotten. It comes to life through pictures of episodes and people, for "makers of pictures," whether they are painters of pictures or motion picture directors who often seek the help of the former, are able to present the scene as a whole rather than unfold it a bit at a time as historians must do in words. History and geography fit together like adjacent parts of a puzzle when audio-visual materials bring out the dependence of history upon environment. Literature and science, art, arts and crafts, and music—all fall into place as vivid, integrated programs, made possible by the skillful selection and combination of these aids.

CREATIVE ACHIEVEMENTS

Art and music, drama and the dance, belong to all of us, and are a part of our lives, whatever our country, race, religion or language may be. Through multi-sensory aids, the wonder of this realization enters the minds and hearts of the students. It makes them true creators, for they realize that there is no class or rank in this cultural heritage, that the message given can be understood by all.

A special Library Corner can be set aside in any classroom where visual aids in the development of the language arts program can be displayed.



Boys and girls grow in comprehension of the knowledge that the arts are everywhere, and that the enjoyment of them belongs to rich and poor alike.

Robert W. de Forest, former president of the Metropolitan Museum of Art, and donor with Mrs. de Forest, of the American Wing which has contributed much to the humanizing of art and history, often told audiences of children in the museum's illustrated and integrated story programs, that they were part owners of the gallery treasures because they were able to enjoy them.

Audio-visual, integrated programs encourage children in their creativeness. They bring forth the idea, which to some children comes as a surprise, that creative ability may belong to the very poor as well as to those endowed with wealth. It is a wonderful idea which stimulates inventiveness and originality in words both spoken and written, in both prose and poetry, in scientific experiments, in original music, and in artistic endeavors through various media—clay, crayon, chalk, paint, dioramas, models, etc. These common cultural languages which they have come to understand produce critical thinking, individual feeling, and creative contributions.

INFLUENCE ON CHARACTER. The understanding and enjoyment of world achievements which come through these programs, often stimulate ideals and develop character. A boy in one of New York City's large junior high schools, a problem in behavior, through his attendance at the museum's

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illustrated story-hour programs which vitalized art and integrated it with history, geography, and music, became so interested in the museum's treasures, that he gave up his questionable street activities on Sundays, and visited the museum each week, instead. His work improved in school to the satisfaction of his teachers, and he helped his mother with money he earned on a job after school to which he was surprisingly faithful. He became a cooperative citizen, offering his serv-

A giant meteor from outer space has multi-sensory appeal for these children visiting the Hayden Planetarium (New York).



ices as a story hour "Knight" each Sunday. He made a real contribution to his community.

If parents can be encouraged to take children on visits to places of interest they will be helping the teachers in the effort to make children visualize and appreciate the world in which they live. Parents' organizations often make this a part of their own program. Members of one such group visited the American Museum of Natural History as a part of their parent training program, and their reaction was expressed by one parent who said, "We took this excursion so that we could introduce these mothers to one of the finest educational opportunities in our city. We did this, not only for their edification, but so that they would interest members of their families (husbands and older children) and their neighbors. We had ample evidence that this was achieved. Some said they could hardly wait for the week-end so that they could return with older children." Another group said they would not be satisfied until all the mothers in the school had been there and so they were going back to organize another visiting group.

TRAINING FOR SELF-MANAGEMENT. The training of boys and girls to serve as projectionists and assistants to the teacher in charge of visual instruction can be made a valuable experience for these students. At one school in up-state New York all projection is taken care of by the Student Projection Squad. Boys and girls are chosen for this squad by means of mechanical aptitude tests at the start of each

CREATIVE ACHIEVEMENTS

school year.* In this way students are secured who have definite aptitude for this type of work and an *esprit de corps* is established which is invaluable. The students thus selected are given a training course by the teacher in charge of visual instruction. It has been found wise not to draw upon students below the eighth grade. The members of the squad thus formed and trained are designated as Certified Operators, under direction of a Student Manager. All details, such as checking equipment, checking program of visual aids to be supplied to various teachers and assigning of projectionists, are carried out by this squad.

As a result of using the services of a well-trained student squad, the following goals have been achieved in this school:

1. Economical operation of the visual instruction program for the entire school.
2. Training of students in mature human relation contacts and work responsibility.

This program has virtually added a new course to the school curriculum, namely, a course in responsible self-management. Moreover, the student has been given a powerful new learning medium both for his own training and for the training of his fellow-students.†

* Three standardized tests have been found to be excellent: (1) O'Rourke's "Mechanical Aptitudes Test", (2) Mellenbruch, Form A, and (3) Revised Minnesota Form Board Test, Series A.

† The program described is in operation at the Roelif Jansen Central School, Hillsdale, New York, under the direction and supervision of Mr. George Colclough, Director of Visual Instruction at the school. Mr. Colclough's complete program is described by him in "Let's Build That Bridge," *Educational Screen*, 1946.

SKILLS AND
CRAFTSMANSHIP

SKILLS AND CRAFTSMANSHIP. When students have been given an opportunity to see works of art and examples of skilled craftsmanship, they gradually become aware of the fact that they themselves can make these experiences part of their own lives. In the Red Bank, New Jersey, High School, a recent project proved the practical value of training students, through visual methods, to create their own works of art. The art instructor departed from the usual practice of painting pictures, designs, posters, etc., and inaugurated a project of repainting and redecorating old furniture. She had

High school students of Red Bank, New Jersey, show skilled craftsmanship in decorating old furniture.



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worked with Peter Hunt, popular decorator, whose furniture and European peasant designs have proved so popular. The designs were so colorful and appealing that she saw in this branch of art an opportunity to give her students the experience of actually decorating and refinishing a piece of furniture and at the same time producing a beautiful example of design work.*

The entire story of color and design was carefully reviewed. Many pictures and magazine clippings of furniture and interiors were studied and discussed. Actual and "imagined" plans for homes, color schemes, and furnishings were thoroughly examined. Each student was then permitted to bring into the classroom a chair, a small table, radio cabinet or the like, on which he could work and which was his to take home when finished. Generally speaking, only a small proportion of the classroom results were of exhibit standard. However, regardless of the student's skill, even those below average learned to produce a finished product in this furniture line.

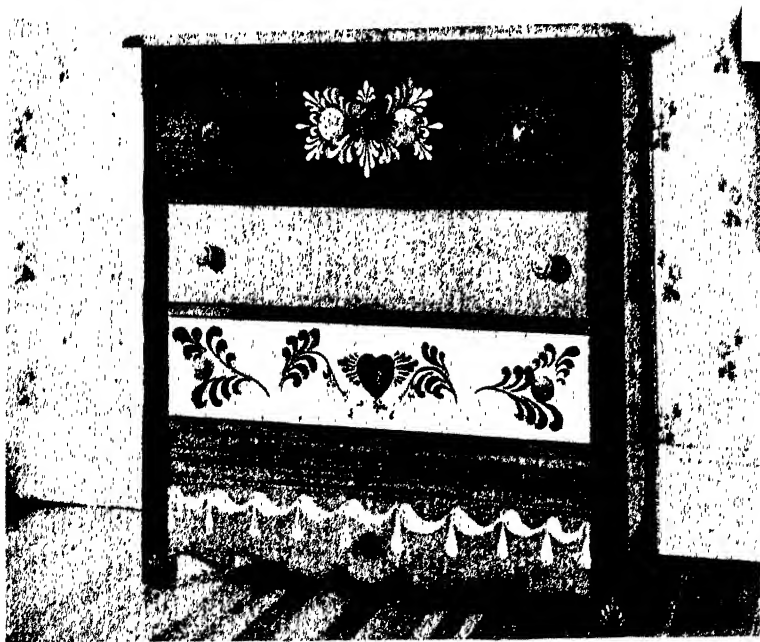
Close correlation of all past work was maintained and the project became the tangible evidence of the value of a mass of accumulated knowledge. The students drew upon a knowledge of the characteristics of paints; they learned how to mix and prepare paints; how to clean, scrape, sandpaper, and re-vamp old furniture; how to apply the new paint and the design and finally how to "antique" the finished product.

* This project was conceived and carried out by Mrs. Frances A. Moore, Art Instructor at the Red Bank, New Jersey, High School, during 1945-1946.

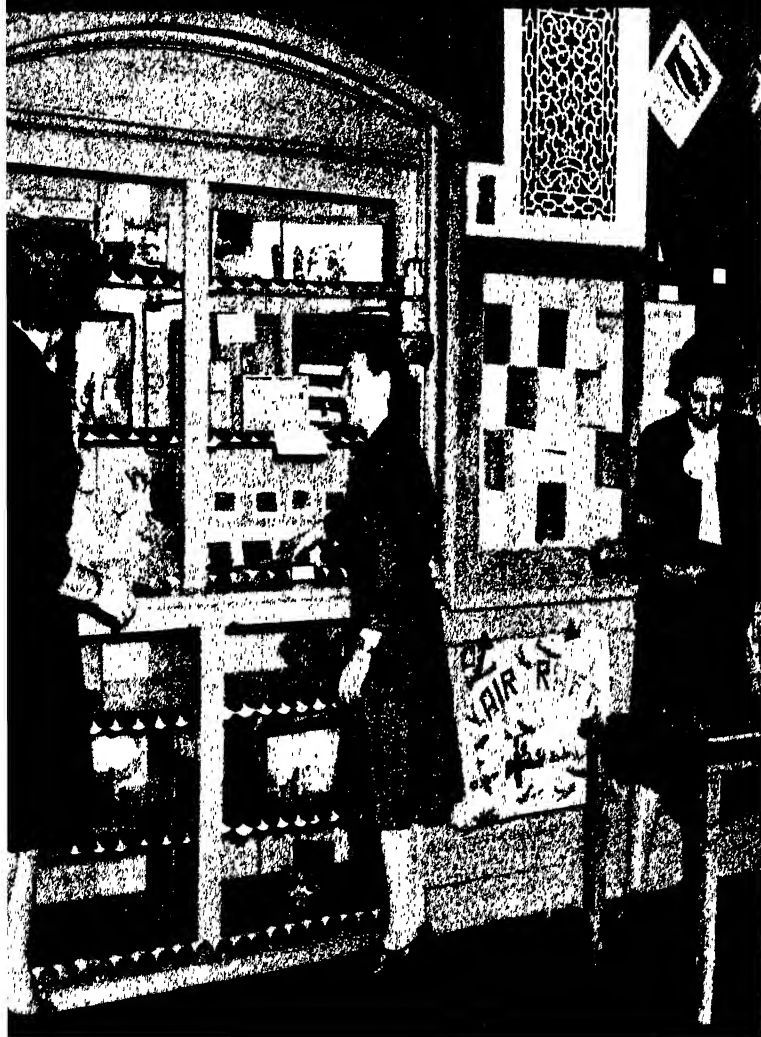
SKILLS AND
CRAFTSMANSHIP

Creative work of this type takes art out of the *classroom* and places it in the home and in the *community*. It also proves to students that artistic skill and craftsmanship are not reserved for the creators of museum pieces but are abilities that may be acquired in some degree by anyone. Students hitherto totally disinterested in decorating or painting took a keen interest in these subjects when they saw the practical application to objects that were part of home and everyday life.

The influence of the popular decorator, Peter Hunt, is shown in this old dresser, redecorated by high school students at Red Bank.



xv. Teacher Education



DO EDUCATORS of today consider seriously enough the responsibility of teacher education institutions to acquaint students about to go out into schools as teachers with the importance of audio-visual aids and their effectiveness in teaching? *

More and more schools throughout the country are making use of the equipment and materials now more generally available. Student teachers should start their teaching experience with full knowledge of what audio-visual enrichment means, its dynamic influence upon the curriculum and upon world understanding.

They should be acquainted with the techniques and skills, with the sources of equipment and materials of this vital method of teaching, with its power as a means of integration with various areas in the curriculum.

The misuse of audio-visual aids must be made clear to these new teachers in order to afford a better understanding of their proper use. Many teachers already in schools, often with years of experience, have the impression that audio-visual enrichment means, literally, the mere showing in classroom or auditorium of many audio-visual aids—flat pictures, slides, filmstrips, dioramas, etc. New and inexperienced teachers need to realize, through required courses which are a definite part of their teacher-training, that this way of presenting

* This chapter is offered as a possible guide for training student teacher classes in the use of audio-visual materials and equipment. It is an outline for course work in this field.

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EDUCATION

audio-visual aids is not genuine audio-visual enrichment.

These courses must demonstrate, through an understanding of the philosophy and educational principles involved, through concrete examples of programs which show the proper and effective use of these materials, that audio-visual enrichment of the curriculum includes:

1. An understanding of the various sensory materials available, and their sources.
2. The realization that an effective use of these materials necessitates intelligent research, selection, evaluation, elimination and combination of the aids and the harmonious relationship of one aid to another.
3. A conviction that audio-visual enrichment is not a separate subject but a teaching method applicable to any and all areas in the curriculum. They should realize that it results in economical, vital and happy learning.
4. Understanding of the interdependence of the various curriculum areas which these aids integrate, and their cultural significance.
5. The need of a specialist to teach and demonstrate the vital use of these materials.
6. A basic development of operational skills.
7. The realization that these aids will never take the place of teachers but will greatly aid in vivid, happy learning experiences which approximate reality—that they supplement teaching.

During the course there should be an opportunity, in laboratory periods, for each of the students to give an audio-visual integrated program of his or her own planning, in which the principles and techniques presented in the course are demonstrated in regular classroom procedures so far as possible.*

Reports, evaluations of audio-visual aids, constructive criticisms of programs and free discussions would be important factors of the course, as vital as the lectures, demonstrations and laboratory periods. Group conferences, also, would be helpful among the specialists and the student teachers and, whenever possible, with children who have been in the demonstration audiences, for their reactions are important.

TOPICS TO BE INCLUDED IN TEACHER EDUCATION COURSE IN
SELECTION AND USE OF AUDIO-VISUAL MATERIALS

1. Philosophy underlying effective utilization of audio-visual materials.
2. How to plan and organize an effective audio-visual teaching program.
3. How to plan and organize the audio-visual instruction room.
4. Enrichment of social studies through audio-visual aids.
5. Enrichment of language arts through audio-visual aids.
6. Enrichment of the sciences through audio-visual aids.

* This is being done in workshops in the Hunter College Education Department and in the School of Education, New York University.

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EDUCATION

7. How to organize and arrange classroom and school museums and exhibits.
8. Sources for audio-visual materials and equipment.
9. How to operate various types of projection equipment.
 - a. Demonstrations by instructor.
 - b. Operation by students.
10. Motion Pictures.
 - a. Discussions of techniques for using motion pictures.
 - b. Demonstrations of use of motion pictures in actual classroom situations.
 - c. Evaluation of motion pictures available for school use.
 - d. Production of school pupil-made motion pictures.
11. Photography and Camera Clubs, Flat Pictures.
 - a. Techniques for use of photographs and pictures.
 - b. How to organize and conduct a school camera club.
12. Lantern Slides.
 - a. Discussions of techniques for utilization of lantern slides.
 - b. How to make standard size and miniature lantern slides.
 - c. Demonstration of use of lantern slides in actual classroom situations.
13. Filmstrips.
 - a. Discussion of techniques for utilization of filmstrips.
 - b. How to make filmstrips.
 - c. Demonstration of use of filmstrips in actual classroom situations.

14. Dioramas.
 - a. How to make dioramas.
 - b. Demonstration of ways of using dioramas in actual classroom situations.
15. Maps, Charts and Globes.
 - a. Discussion of techniques for use of maps, charts and globes.
 - b. Demonstration of effective utilization of maps, charts, and globes.
16. Radio, Television, Recordings.
 - a. Discussion of techniques for utilization of radio, television, and recordings.
 - b. Production and presentation of programs using these materials.
17. Training the Student Visual-Aid Staff.
 - a. How to organize and train a student visual-aid staff.
 - b. Role of student visual-aid staff in audio-visual program of school.
18. Criteria and Standards for Selection and Use of Audio-Visual Materials.
 - a. Discussion of criteria and standards applicable to various types of materials.
 - b. Formulation of criteria and standards for selection and use of audio-visual materials.

xvi. Where to Obtain Help



AUDIO-VISUAL AIDS DISTRIBUTION CENTERS— STATE AND REGIONAL

ALABAMA

Superintendent of Visual Aids, University of Alabama, University.

ARIZONA

Director of Extension, University of Arizona, Tucson.

ARKANSAS

Director, Department of Public Relations, Arkansas State Teachers College, Normal Station, Conway.

CALIFORNIA

Extension Division, University of California, Berkeley.

Extension Division, University of California, Los Angeles.

Visual Aids Supervisor, Department of Education, Los Angeles.

Director of Visual Education, Stockton Junior College, Stockton.

Visual Education Department, Mendocino County Schools, Ukiah.

COLORADO

Director, Bureau of Visual Instruction, University of Colorado, Boulder.

Director, Film Center, University of Denver, Denver.

Colorado State College of Education, Greeley.

CONNECTICUT

Director, Audio-Visual Aids Center, University of Connecticut, Storrs.

FLORIDA

Department of Audio-Visual Instruction, University of Florida, Gainesville.

GEORGIA

General Extension Service, University System of Georgia, Atlanta.

WHERE TO
OBTAIN HELP

HAWAII

University Extension Division, University of Hawaii, Honolulu.

IDAHO

Assistant Extension Editor, Extension Service, University of Idaho, Boise.

Director, University Educational Film Service, University of Idaho, Southern Branch, Pocatello.

ILLINOIS

Director, Film Library, Southern Illinois Normal University, Carbondale.

Supervisor of Visual Aids, University of Illinois, Champaign.

INDIANA

Consultant, Bureau of Audio-Visual Aids, Indiana University, Bloomington.

Director, Teaching Materials Service, Ball State Teachers College, Muncie.

Director of Extension, Indiana State Teachers College, Terre Haute.

IOWA

Director, Visual Instruction Service, Iowa State College, Ames.
Department of Visual Instruction, University of Iowa, Iowa City.

KANSAS

Director, Extension Division, Kansas State College, Fort Hays.
Bureau of Visual Instruction, Extension Division, University of Kansas, Lawrence.

KENTUCKY

Audio-Visual Aids Department, University of Kentucky, Lexington.

LOUISIANA

Department of Visual Instruction, State Department of Education, Baton Rouge.

General Extension Service, Louisiana State University, University.

**DISTRIBUTION
CENTERS**

MAINE

Dean, School of Education, University of Maine, Orono.

MARYLAND

Maryland Academy of Sciences, Baltimore.

MASSACHUSETTS

Director of Visual Instruction, State Department of Education,
Boston.

Director, Division of Teaching Aids, Boston University, Boston.

Director, Harvard Film Service, Harvard University, Cambridge.

MICHIGAN

Director, Visual Education, University of Michigan, Ann Arbor.

Assistant Extension Editor, Information Service, Michigan State
College, East Lansing.

Director of Extension, Central Michigan College of Education, Mt.
Pleasant.

MINNESOTA

Director, Visual Education, Extension Division, University of
Minnesota, Minneapolis 14.

MISSOURI

Visual Education Service, Extension Division, University of Mis-
souri, Columbia.

MONTANA

Director of Publications, Extension Service, Montana State Col-
lege, Bozeman.

Supervisor, Visual Aids in Education, Department of Public In-
struction, Helena.

NEBRASKA

University Extension Division, University of Nebraska, Lincoln.

NEVADA

Extension Forester and Film Librarian, University of Nevada,
Reno.

**WHERE TO
OBTAIN HELP**

NEW HAMPSHIRE

Extension Specialist in Visual Aids, University of New Hampshire,
Durham.

Director, Dartmouth College Films, Hanover.

NEW JERSEY

New Jersey State Museum, Trenton.

Teaching Aids Service, New Jersey State Teachers College, Mont-
clair.

NEW MEXICO

Director of Extension, University of New Mexico, Albuquerque.

NEW YORK

Buffalo Society of Natural Science, Buffalo.

Principal, State Normal and Training School, Cortland.

Executive Secretary, Cooperative Film Library, State Teachers
College, Fredonia.

Film Librarian, New York University Film Library, Washington
Square, New York City.

Department of Education, American Museum of Natural History,
Central Park West at 79th Street, New York City.

Executive Secretary, Adirondack Film Library, State Teachers
College, Plattsburg.

Executive Secretary, Potsdam State Teachers College, Coopera-
tive School Film Library of Northern New York, Potsdam.

Librarian, Rush Rhees Library, University of Rochester, Rochester.
School of Education, Syracuse University, Syracuse.

NORTH CAROLINA

Bureau of Visual Instruction, University Extension Division, Uni-
versity of North Carolina, Chapel Hill.

NORTH DAKOTA

Director of Visual Education, North Dakota State College, Fargo.
University Extension Division, University Station, Grand Forks.

DISTRIBUTION
CENTERS

OHIO

Director of Visual Instruction, State Department of Education,
Columbus.

OKLAHOMA

Director of Visual Instruction, East Central State College, Ada.
Extension Division, University of Oklahoma, Norman.

OREGON

Head, Visual Instruction Department, Oregon State College,
Corvallis.

PENNSYLVANIA

Registrar, Classroom Film Library, Bucknell University, Lewis-
burg.

Sensory Aids Director, State Teachers College, Millersville.

Curator, Commercial Museum, Philadelphia.

Curator, University Museum, University of Pennsylvania, 33rd and
Spruce Streets, Philadelphia.

Director, P.C.W. Film Service, Pennsylvania College for Women,
Pittsburgh.

Supervisor, Audio-Visual Aids, Pennsylvania State College, State
College.

PUERTO RICO

Department of Education, San Juan.

SOUTH CAROLINA

Director, Extension Division, University of S. C., Columbia.

SOUTH DAKOTA

Director of Extension, University of South Dakota, Vermillion.

TENNESSEE

Specialist in School and Community Service, University Extension,
University of Tennessee, Box 4218, University Station, Knoxville.

Director, Joint University Libraries, Vanderbilt University, Nash-
ville.

**WHERE TO
OBTAIN HELP**

TEXAS

Director, Visual Instruction, Extension Building, University of Texas, Austin.

Director, Film Division, Bureau of Public Service, West Texas State Teachers College, Canyon.

Department of Public Service, Sam Houston State Teachers College, Huntsville.

Director, East Texas Bureau of Visual Education, Kilgore Junior College, Kilgore.

Director, Division of Extension, Texas Technological College, Lubbock.

Department of Education, S. A. Austin State Teachers College, Nacogdoches.

UTAH

Secretary, Bureau of Visual Instruction, Brigham Young University, Provo.

Director, Extension Division, University of Utah, Salt Lake City.

VERMONT

Robert Hull Fleming Museum, Classroom Film Library, University of Vermont, Burlington.

VIRGINIA

Supervisor, Audio-Visual Education, State Board of Education, Richmond.

Director, Bureau of Audio-Visual Aids, Extension Division, University of Virginia, University.

WASHINGTON

Director of Public Service, Central Washington College of Education, Ellensburg.

Director, Bureau of Visual Instruction, State College of Washington, Pullman.

EQUIPMENT
SUPPLIES

WEST VIRGINIA

Librarian, West Virginia University, Morgantown.

WISCONSIN

Bureau of Visual Instruction, University of Wisconsin, Madison.

EQUIPMENT AND SUPPLIES

MOTION PICTURES

A. F. Films, Inc. 1600 Broadway, New York 19, New York

Akin and Bagshaw, Inc., 2023 E. Colfax Avenue, Denver, Colorado

American Museum of Natural History, 79th Street and Central
Park West; New York 24, New York

Association Films (Y.M.C.A. Motion Picture Bureau)

351 Turk Street, San Francisco 2, California

19 South La Salle Street, Chicago 3, Illinois

347 Madison Avenue, New York 17, New York

1700 Patterson Avenue, Dallas 1, Texas

Astor Pictures Corporation, 130 West 46th Street, New York 19,
New York

Bailey Film Service, P.O. Box 2528, Hollywood 28, California

Bausch and Lomb Optical Company, Rochester 2, New York

Bell and Howell Company, 7100 McCormick Road, Chicago 45,
Illinois

Brandon Films, 1600 Broadway, New York 19, New York

Bray Studios, Inc., 729 Seventh Avenue, New York 19, New York

Castle Films, Inc., 30 Rockefeller Plaza, New York 20, New York

Cathedral Films, 6404 Sunset Boulevard, P.O. Box 589, Hollywood
28, California

Catholic Movies, 220 West 42nd Street, New York 18, New York;

1409-79th Street, North Bergen, New Jersey

Commonwealth Pictures Corporation, 729 Seventh Avenue, New
York 19, New York

**WHERE TO
OBTAIN HELP**

De Vry School Films, 1111 Armitage Avenue, Chicago 11, Illinois
Eastman Kodak Stores, Inc. (Kodascope Libraries Division), 356
Madison Avenue, New York 17, New York

Edited Pictures System, 165 West 46th Street, New York 19, New
York

Encyclopedia Britannica Films Inc., 20 North Wacker Drive,
Chicago 6, Illinois

Eye Gate House, Inc., 330 West 42nd Street, New York 18, New
York

Films, Inc.

1709 W. 8th Street, Los Angeles 14, California

101 Marietta Street, Atlanta 3, Georgia

64 East Lake Street, Chicago, Illinois

330 West 42nd Street, New York 18, New York

109 N. Akard Street, Dallas 1, Texas

Gallagher Film Service, Bay Theater Building, Green Bay, Wis-
consin; 639 N. 7th Street, Milwaukee, Wisconsin

General Electric Company, 1 River Road, Schenectady 5, New York

Hoffberg Productions, Inc., 620 Ninth Avenue, New York 18, N.Y.

Institutional Cinema Service, Inc., 1560 Broadway, New York 19,
New York

The Jam Handy Organization, 2821 East Grand Boulevard, Detroit
11, Michigan

Knowledge Builders (Classroom Films), 625 Madison Avenue,
New York 22, New York

Lewis Film Service, 1145 N. Market Street, Wichita 5, Kansas

Metropolitan Life Insurance Company (Health and Welfare Divi-
sion), 1 Madison Avenue, New York 10, New York

The Museum of Modern Art Film Library, 11 West 53rd Street,
New York 19, New York

National Audubon Society, 1000 Fifth Avenue, New York 28, N.Y.

National Council of Teachers of English, 211 West 68th Street,
Chicago 21, Illinois

**EQUIPMENT
SUPPLIES**

Official Films, Inc., 25 West 45th Street, New York 19, New York
Pictorial Films, Inc., R.K.O. Building, Radio City, New York 20,
New York

Post Pictures Corporation, 723 Seventh Avenue, New York 19,
New York

The Princeton Film Center, Princeton, New Jersey

Screen Adettes Inc.

1709 West 8th Street, Los Angeles 14, California

68 Post Street, San Francisco 4, California

611 North Tillamook Street, Portland 12, Oregon

Shadow Arts Studio, 1036 Chorro Street, San Luis Obispo, Cali-
fornia

Southern Visual Films, 686-689 Shrine Building, Memphis 1,
Tennessee

Swank Motion Pictures, 614 N. Skinker Boulevard, St. Louis 5,
Missouri

Visual Education, Inc.

Twelfth at Lamar, Austin 21, Texas

602 N. St. Paul Street, Dallas 1, Texas

4431 Foard, Fort Worth, Texas

3905 South Main Street, Houston 4, Texas

Young America Films, Inc., 18 East 41st Street, New York 17,
New York

FILM STRIPS

Castle Films, Inc., 30 Rockefeller Plaza, New York 20, New York
Cathedral Films, 6404 Sunset Boulevard, P.O. Box 589, Hollywood
28, California

Eye Gate House, Inc., 330 West 42nd Street, New York 18, New
York

Informative Classroom Picture Publishers, 40 Ionia Avenue, N.W.,
Grand Rapids 2, Michigan

WHERE TO OBTAIN HELP

The Jam Handy Organization, 2821 East Grand Boulevard, Detroit 11, Michigan
Lee Lyles, Assistant to the President, Santa Fe Railway, Chicago, Illinois
Philp Photo Visual Service, 1954 Pasadena Avenue, Long Beach 6, California
Society for Visual Education, Inc., 100 East Ohio Street, Chicago 11, Illinois
Stillfilm, Inc., 8443 Melrose Avenue, Hollywood 46, California
Visual Sciences, Suffern, New York
The Wild Flower Preservation Society, Inc., 3740 Oliver Street N.W., Washington 15, D.C.
Young America Films, 18 East 41st Street, New York 17, New York

PROJECTORS

American Optical Company, Box A, Buffalo 15, New York
Ampro Corporation, 2835 N. Western Avenue, Chicago 18, Illinois;
545 Fifth Avenue, New York, New York
Bausch and Lomb Optical Company, Rochester 2, New York
Bell and Howell Company, 7100 McCormick Road, Chicago 45, Illinois
Charles Beseler Company, 243 East 23rd Street, New York 10, New York
De Vry Corporation, 1111 Armitage Avenue, Chicago 14, Illinois
Eastman Kodak Company, Rochester 4, New York
Eye Gate House, Inc., 330 West 42nd Street, New York 18, N. Y.
Gallagher Film Service, Bay Theater Building, Green Bay, Wisconsin; 639 N. 7th Street, Milwaukee, Wisconsin
Hirsch and Kaye, 239 Grant Avenue, San Francisco 8, California
Keystone View Company, Meadville, Pennsylvania
Radio Corporation of America, RCA Victor Division, Educational Department, Camden, New Jersey

EQUIPMENT SUPPLIES

- Ralke Company, 829 South Flower Street, Los Angeles 14, California
Ryan Visual Aids Service, 409-411 Harrison Street, Davenport, Iowa
Sawyer's Inc. (View-Master), 725 S.W. 20th Place, Portland 7, Oregon
S.O.S. Cinema Supply Corporation, 449 West 42nd Street, New York 18, New York
Society for Visual Education, Inc., 100 East Ohio Street, Chicago 11, Illinois
Southern Visual Films, 686-689 Shrine Building, Memphis 1, Tennessee
Victor Animatograph Corporation (Division of Curtiss-Wright Corp.), Davenport, Iowa
Visual Education, Inc.
Twelfth at Lamar, Austin 21, Texas
602 N. St. Paul Street, Dallas 1, Texas
4431 Foard, Fort Worth, Texas
3905 South Main Street, Houston 4, Texas

RECORDING AND SOUND EQUIPMENT

- Audio Devices, Inc., 444 Madison Avenue, New York 22, New York
David Bogen Company, Inc., 663 Broadway, New York 12, N. Y.
General Electric Company, River Road, Schenectady 5, New York
The Hallicrafters Company, 4401 West Fifth Avenue, Chicago 24, Illinois
Radio Corporation of America, RCA Victor Division, Educational Department, Camden, New Jersey
Rek-O-Kut Company, 146 Grand Street, New York 13, New York
Wilcox-Gay Corporation, Charlotte, Michigan

S C R E E N S

- Da-Lite Screen Company, Inc., 2711-23 N. Pulaski Road, Chicago 39, Illinois

WHERE TO OBTAIN HELP

Eye Gate House, Inc., 330 West 42nd Street, New York 18, New York

Hirsch and Kaye, 239 Grant Avenue, San Francisco 8, California
Radiant Manufacturing Corporation, 1140-46 West Superior Street,
Chicago 22, Illinois

Society for Visual Education, Inc., 100 East Ohio Street, Chicago
11, Illinois

Southern Visual Films, 686-689 Shrine Building, Memphis 1, Tennessee

SLIDES

American Museum of Natural History, 79th Street and Central
Park West, New York 24, New York

Art Education, Inc., 6 East 34th Street, New York 16, New York
(2x2" slides only)

Brooking Tatum, Kelseyville, California
(2x2" slides only)

Castle Films, Inc., 30 Rockefeller Plaza, New York 20, New York
(2x2" slides only)

Eye Gate House, Inc., 330 West 42nd Street, New York 18, New York

Gallagher Film Service, Bay Theater Building, Green Bay, Wisconsin; 639 N. 7th Street, Milwaukee, Wisconsin; (2x2" slides only)

Hirsch and Kaye, 239 Grant Avenue, San Francisco 8, California
Keystone View Company, Meadville, Pennsylvania

Kime Kolor Pictures, 1761 Sonoma Drive, Altadena, California
(2x2" slides only)

Metropolitan Museum of Art, 82nd Street and Fifth Avenue, New
York 28, New York

Munday and Collins, 814 West 8th Street, Los Angeles 14, California

MAPS, CHARTS
GLOBES

- National Audubon Society, 1000 Fifth Avenue, New York 28, New York
Philp Photo Visual Service, 1954 Pasadena Avenue, Long Beach 6, California (2x2" slides only)
Ryan Visual Aids Service, 409-411 Harrison Street, Davenport, Iowa
Shadow Arts Studio, 1036 Chorro Street, San Luis Obispo, California
Society for Visual Education, Inc., 100 East Ohio Street, Chicago 11, Illinois

STEREOGRAPHS AND STEREOSCOPES

- Keystone View Company, Meadville, Pennsylvania
Sawyer's Inc. (View-Master), 725 S.W. 20th Place, Portland 7, Oregon

MAPS, CHARTS AND GLOBES

- Denoyer-Geppert Company, 5235 Ravenswood Avenue, Chicago 40, Illinois
C. S. Hammond and Company, 88 Lexington Avenue, New York 16, New York
National Geographic Society (School Service Division), 16 and M Streets N.W., Washington 6, D.C.
A. J. Nystrom and Company, 3333 Elston Avenue, Chicago 18, Illinois
Rand McNally and Company
125 E. Sixth Street, Los Angeles, California
619 Mission Street, San Francisco, California
National Press Building, Washington, D.C.
536 S. Clark Street, Chicago, Illinois
111 Eighth Avenue, New York 11, New York
Weber Costello Company, 12th and McKinley, Chicago Heights, Illinois

WHERE TO
OBTAIN HELP

MUSEUMS COOPERATING WITH AUDIO-
VISUAL EDUCATION PROGRAMS

Since there are many museums in the United States, it would be beyond the scope of this book to list them all. A classified directory of the nation's museums is contained in *The Museum In America* by Laurence V. Coleman. Price per set \$7.50. Published by the American Association of Museums, at the Smithsonian Institution, Washington 25, D.C. This book may be seen in any museum library.

Following is a partial listing of representative museums offering their facilities for use in audio-visual education:

ARIZONA

Petrified Forest National Monument, Holbrook

CALIFORNIA

Los Angeles County Museum of History, Science and Art, Exposition Park, Los Angeles 7

Southwest Museum, Los Angeles 42

Oakland Public Museum, 1426 Oak Street, Oakland 12

Junipero Serra Museum, San Diego Historical Society, 2727 Presidio Drive, San Diego 3

San Diego Museum of Man, Balboa Park, San Diego

California Academy of Sciences, Golden Gate Park, San Francisco 18

California Palace of the Legion of Honor, Lincoln Park, San Francisco 21

M. H. De Young Memorial Museum, Golden Gate Park, San Francisco

Junior Museum, 600 Ocean Avenue, San Francisco

MUSEUMS
COOPERATING

COLORADO

University of Colorado Museum, Boulder
The Denver Art Museum, Denver
Mesa Verde National Park Museum, Mesa Verde National Park
Rocky Mountain National Park, Estes Park

CONNECTICUT

The Bruce Museum of Greenwich, Greenwich
Children's Museum of Hartford, 609 Farmington Avenue, Hartford 5
Yale University Art Gallery, New Haven
The Slater Memorial Museum, Norwich Free Academy, Norwich
Stamford Museum of Natural History, Stamford

DISTRICT OF COLUMBIA

The Howard University Gallery of Art, Founders Library, Howard University, Washington 1
The Barnett Aden Gallery, 127 Randolph Place N.W., Washington 1

ILLINOIS

The Art Institute of Chicago, Michigan Avenue at Adams Street, Chicago 3
The Chicago Academy of Sciences, 2001 North Clark Street, Chicago 14
Illinois State Museum, Springfield

IOWA

Davenport Public Museum, Davenport
Department of History and Archives, Des Moines
Museum of Natural History, University of Iowa, Iowa City

KENTUCKY

The Baker-Hunt Foundation, Inc., 620 Greenup Street, Covington
The J. B. Speed Memorial (Art) Museum, Third and Shipp Streets, Louisville 8

**WHERE TO
OBTAIN HELP**

LOUISIANA

Louisiana State Museum, Jackson Square, New Orleans 16

MAINE

Wadsworth-Longfellow House, 487 Congress Street, Portland

MARYLAND

Baltimore Museum of Art, Wyman Park, Baltimore 18

Ft. McHenry, Baltimore

Maryland Historical Society Museum and Library, 201 W. Monument Street, Baltimore 1

Municipal Museum of the City of Baltimore, Baltimore

Star-Spangled Banner Flag House, 844 E. Pratt Street, Baltimore

Walters Art Gallery, Baltimore

The Washington County Museum of Fine Arts, Hagerstown

MASSACHUSETTS

Addison Gallery of American Art, Andover

Attleboro Museum, Attleboro

The Children's Museum (Boston), 60 Burroughs Street, Jamaica Plain 30

Institute of Modern Art, Boston

Museum of Fine Arts, Boston 15

Society for the Preservation of New England Antiquities, 141 Cambridge Street, Boston

Fogg Art Museum, Harvard University, Cambridge 38

Botanical Museum, Harvard University, Cambridge

The Longfellow House, 105 Brattle Street, Cambridge

The Fitchburg Art Center, Fitchburg

The Berkshire Museum, Pittsfield

The Essex Institute, Salem

Springfield Museum of Art, Springfield

Department of Art (Farnsworth Museum of Art), Wellesley College, Wellesley 81

Lawrence Art Museum, Williams College, Williamstown

Worcester Art Museum, Worcester

MUSEUMS
COOPERATING

MICHIGAN

Educational Department, The Detroit Institute of Arts, Detroit 2
Children's Museum of Detroit, 5205 Cass Avenue, Detroit 2
Grand Rapids Public Museum (Kent Scientific Museum), Grand
Rapids
The Kalamazoo Institute of Arts, Kalamazoo 9
Kalamazoo Museum, 335 South Rose Street, Kalamazoo

MINNESOTA

The Minneapolis Institute of Arts, Minneapolis 4
Minneapolis Science Museum, 10th and Hennepin, Minneapolis
Minnesota Museum of Natural History, University of Minnesota,
Minneapolis 14
Saint Paul Institute, St. Paul
St. Paul Science Museum, 51 University Avenue, St. Paul

MISSOURI

William Rockhill Nelson Gallery of Art, Atkins Museum of Fine
Arts, Kansas 2
The St. Joseph Museum, 19th at Felix, St. Joseph 23
City Art Museum of St. Louis, Forest Park 5
Missouri Historical Society, Jefferson Memorial Building, St. Louis
12
Division of Audio-Visual Education of the St. Louis Public Schools,
4466 Olive Street, St. Louis 8

MONTANA

Glacier National Park Museum, Belton

NEW HAMPSHIRE

The Currier Gallery of Art, 192 Orange Street, Manchester

NEW JERSEY

The Montclair Art Museum, South Mountain and Bloomfield
Avenues, Montclair

WHERE TO
OBTAIN HELP

NEW MEXICO

Aztec Ruins National Monument, P.O. Box 457, Aztec
Laboratory of Anthropology, Santa Fé
Museum of New Mexico, Santa Fé

NEW YORK (CITY)

Poe Cottage, Kingsbridge Road at Grand Concourse, Bronx
Brooklyn Children's Museum, Brooklyn Avenue and Prospect
Place, Brooklyn
The Brooklyn Museum, The Brooklyn Institute of Arts and
Sciences, Eastern Parkway and Washington Avenue, Brooklyn 17
Lefferts Homestead, Prospect Park at Flatbush Avenue and Empire
Boulevard, Brooklyn
The American Museum of Natural History, Central Park West at
79th Street, New York 24
American Numismatic Society, Broadway and 156th Street, New
York 32
The Cloisters (branch, Metropolitan Museum of Art), Fort Tryon
Park 33, New York
Fraunces Tavern, Broad and Pearl Streets, New York
The Frick Collection, 1 East 70th Street, New York 21
The Hispanic Society of America, Broadway and 156th Street, New
York 32
The Metropolitan Museum of Art, Fifth Avenue and 82nd Street,
New York 28
Museum of the American Indian, Broadway at 155th Street, New
York
Museum of the City of New York, Fifth Avenue at 104th Street,
New York
The Museum of Modern Art, 11 West 33rd Street, New York
The New York Botanic Garden Museum, 801 Madison Avenue,
New York
The New York Historical Society, 170 Central Park West, New
York 24

MUSEUMS
COOPERATING

New York Museum of Science and Industry, 30 Rockefeller Plaza,
New York 20
New York Zoological Park, Bronx Park, New York 60
The Pierpont Morgan Library, 29 East 36th Street, New York
The Roger Morris-Jumel Mansion, 160th Street and Edgecombe
Avenue, New York
Theodore Roosevelt House, 28 East 20th Street, New York
Van Cortlandt House Museum, Van Cortlandt Park, New York
Whitney Museum of American Art, 10 West 8th Street, New York
The Staten Island Institute of Arts and Sciences, Stuyvesant Place
and Wall Street, St. George, Staten Island

NEW YORK (STATE)

Wells College, Department of Fine Arts, Aurora-on-Cayuga
The Bear Mountain Trailside Museums and Nature Trails, Pali-
sades Interstate Park Commission, Bear Mountain
Albright Art Gallery, Buffalo 9
Buffalo Museum of Science, Humboldt Park, Buffalo 11
Hudson River Museum at Yonkers, Trevor Park, Yonkers 3

OHIO

The Akron Art Institute, 140 East Market Street, Akron 8
Taft Museum, Cincinnati Institute of Fine Arts, 316 Pike Street,
Cincinnati 2
Cincinnati Art Museum, Eden Park, Cincinnati 6
Cincinnati Museum of Natural History, Central Parkway at Wal-
nut Street, Cincinnati 10
The Cleveland Museum of Art, Cleveland 6
The Cleveland Museum of Natural History, 2717 Euclid Avenue,
Cleveland 15
Ohio State Museum (Educational Service), Columbus
Johnson Humrickhouse Memorial Museum, Coshocton
Dayton Public Library Museum, 251 E. 2nd Street corner Patter-
son Boulevard, Dayton, 2

**WHERE TO
OBTAIN HELP**

Art Institute, Massillon
The Dudley Peter Allen Memorial Art Museum, Oberlin College,
Oberlin
Butler Art Institute, 524 Wick Avenue, Youngstown 2
Art Institute, Zanesville

OREGON

Portland Art Museum, West Park and Madison, Portland 5

PENNSYLVANIA

Pennsylvania State Museum, Harrisburg
The Commercial Museum, 34th Street below Spruce, Philadelphia 4
The Franklin Institute of the State of Pennsylvania, Philadelphia 3
Independence Hall, National Museum, Philadelphia
The University Museum, University of Pennsylvania, 33rd and
Spruce Streets, Philadelphia 4
Carnegie Museum, Pittsburgh 13
The Reading Public Museum and Art Gallery, Reading
Everhart Museum of Natural History, Science and Art, Scranton

RHODE ISLAND

Rhode Island School of Design Museum, Providence 3

SOUTH CAROLINA

The Charleston Museum, Charleston 16
The Gibbs Art Gallery, Charleston
State Forestry Commission, Columbia

TEXAS

Witte Museum, Brackenridge Park, San Antonio

UTAH

Zion Museum, Zion National Park, Springdale

VERMONT

Historical Museum, Bennington
Old Stone House, Brownington
Robert Hull Fleming Museum, University of Vermont, Burlington

PICTURES
PRINTS

White Schoolhouse, East Burke
Fairbanks Museum of Natural Science, St. Johnsbury
Westminster Institute, Westminster
Country Store Museum, Weston
Williams Collection of Japanese Art (Norman Williams Library),
Woodstock

VIRGINIA

Mount Vernon Ladies' Association, Mount Vernon
The Valentine Museum, 1015 East Clay Street, Richmond 19
Colonial Williamsburg, Inc., Williamsburg

WASHINGTON

Mount Rainier National Park, Longmire

WISCONSIN

Neville Public Museum, 129 S. Jefferson Street, Green Bay
Janesville Art League, Woman's Club, 108 S. Jackson, Janesville
Kenosha Historical and Art Museum, Civic Center, Kenosha
Madison Art Association, 2011 Monroe Street, Madison
The State Historical Society of Wisconsin Museum, 816 State
Street, Madison 6
Wisconsin Union, University of Wisconsin, Madison
Milwaukee Art Institute, 772 N. Jefferson Street, Milwaukee 2
Milwaukee Public Museum, Milwaukee 3
Oshkosh Public Museum, 787 Algoma Boulevard, Oshkosh
The Charles A. Wustum Museum of Fine Arts, 2542 N. Western
Avenue, Racine

PICTURES AND PRINTS

Art Education, Inc., 6 East 34th Street, New York 16, New York
Artext Prints, Inc., Westport, Connecticut
Colonial Art Company, 1336-1338 N. West First Street, Oklahoma
City 4, Oklahoma

WHERE TO OBTAIN HELP

F. E. Compton Company, 1000 North Dearborn Street, Chicago 10, Illinois

Creative Education Society, Mankato, Minnesota

Informative Classroom Picture Publishers, 40 Ionia Avenue, N.W., Grand Rapids 2, Michigan

Metropolitan Museum of Art, 82nd Street and Fifth Avenue, New York 28, New York

National Audubon Society, 1000 Fifth Avenue, New York 28, N. Y.

National Geographic Society (School Service Division), 16 and M Streets N.W., Washington 6, D.C.

The Perry Pictures Company, Malden, Massachusetts

Rudolf Lesch Fine Arts, Inc., 225 Fifth Avenue, New York 10, New York

University Prints, 11 Boyd Street, Newton 58, Massachusetts

W. A. Wilde Company, 131 Clarendon Street, Boston 16, Mass.

PROGRAM SOURCES

Audio-Visual Aids Information Center, American Museum of Natural History, 79th Street and Central Park West, New York 24, New York

Columbia Broadcasting Company, 485 Madison Avenue, New York 22, New York

Department of Visual Instruction, National Education Association, 1201 Sixteenth Street, N. W., Washington, D.C.

Directory of Film Sources, Bell and Howell Company, 7100 McCormick Road, Chicago 45, Illinois

Education Film Guide, H. W. Wilson Company, 950-972 University Avenue, New York 52, New York

PUBLICATIONS

BOOKS

- Dale, E., *Audio-Visual Methods in Teaching*, 1946, Dryden Press, New York, New York.
- Dent, E. C., *The Audio-Visual Handbook*. 1946. Society for Visual Education, Inc., Chicago, Illinois.
- Hoban, C. F., Jr., *Focus on Learning: Motion Pictures in the School*. 1942. American Council on Education, Washington, D.C.
- Hoban, C. F.; Hoban, C. F., Jr., *Visualizing the Curriculum*, 1937. The Cordon Company, New York, New York.
- Keith, Alice, *How To Speak and Write for Radio*, 1944. Harper and Brothers, New York, New York.
- Levenson, W. B., *Teaching Through Radio*. 1945. Farrar and Rinehart, New York, New York.
- McKown, H. C.; Roberts, A. B., *Audio-Visual Aids to Instruction*. 1940. McGraw-Hill Company, New York, New York.
- Wittich, W. A.; Fowlkes, J. G., *Audio-Visual Paths to Learning*. 1946. Harper and Brothers, New York, New York.

MAGAZINES

- Business Screen*, 20 North Wacker Drive, Chicago, 11, Illinois.
- Educational Screen*, 64 East Lake Street, Chicago, Illinois.
- Audio-Visual Guide*, 172 Renner Avenue, Newark, New Jersey.
- Film News*, American Film Center, Inc.; 45 Rockefeller Plaza, New York 20, New York.
- Film World*, 6060 Sunset Boulevard, Hollywood 28, California.
- New Movies*, National Board of Review of Motion Pictures, 70 Fifth Avenue, New York 11, New York.
- See and Hear*, E. M. Hale Company, Eau Claire, Wisconsin.

GLOSSARY

The terms included in this glossary are those used in the body of this textbook. From time to time commercial dealers and the producers of various audio-visual aids prepare new equipment, and the reader is advised to consult the catalogs and magazines dealing with such materials for additions and modifications in terminology.

ANAGLYPH. A special type of stereoscopic picture printed in two colors (red and blue). This picture must be viewed through a stereoscopic viewer fitted with similar two-color filters in order to obtain the three-dimensional effect which it is designed to give.

ARTIFACTS. Anything made or modified by human skill; artificially produced evidences of the life and culture of peoples.

AUDIO-VISUAL MATERIALS. All or any of those teaching aids which may be brought to bear upon a lesson for the purpose of vitalizing and enriching the learning experience for the child.

BALOPTICON. Trade name for the projector made by the Bausch and Lomb Company for the projection of lantern slides and opaque materials. (See Opaque Projector.)

BEADED SCREEN. A white cloth screen, in the surface coating of which are millions of small bead-particles of crystal or glass. Due to the combination of the reflective qualities of both the cloth and the beads, this screen gives a semi-diffuse reflection of light which is particularly effective for small projection rooms, where the viewing angle is less than twenty-two degrees, and for color projection. (See also Opaque Screen, Screen, Sound Screen, Translucent Screen.)

GLOSSARY

CHART. A diagram, outline or delineation, having some geographical or physical signification; a type of graph showing changes; a tabular representation of factual data.

COLLECTION. A group of materials brought together in one place. The materials may be related in type and subject or they may be totally different.

COVER GLASS. The clear, protecting glass placed over the picture drawn on etched or ground glass to make a lantern slide. The cover glass serves to protect the slide picture.

DELINEASCOPE. Trade name for the projector manufactured by the Spencer Lens Company for the projection of lantern slides and opaque materials. (See Opaque Projector.)

DESIGN. The composition or arrangement of the various elements of a picture to form an harmonious pattern.

DIORAMA. The miniature, three-dimensional group consisting of small modeled and colored figures and specimens, with accessories, in an appropriate setting, and in most instances artificially lighted. The scale and size of the group is variable; there is no limitation as to subject matter, which may be realistic or imaginative according to what the creator of the group wishes to portray.

EIGHT MILLIMETER FILM. The narrow-gauge, acetate-base film now available for use in classroom and home. At present it is not used to any great extent in schools, and is generally limited in scope and use. (See also Sixteen Millimeter Film, Thirty-five Millimeter Film, Motion Picture Film, Silent Film, Sound Film.)

ETCHED GLASS. Glass, one side or surface of which has been etched or ground with an abrasive. Glass so treated is most satisfactory for the making of lantern slides, as it takes crayon, pencil, ink and paint markings. It is also known as Ground Glass.

EXHIBIT. A formal arrangement or presentation of objects,

models, specimens or collections of materials for purposes of display and study.

FIELD TRIP. A journey taken by a class or school group to some point of interest outside the school building. The journey may be for the purpose of supplementing school work, or it may be for social purposes. (See also Treasure Trip.)

FILMSLIDE. A slide made directly on color or black and white 35 mm. non-inflammable film. The film is processed by the manufacturer and returned as individual slides, either in cardboard mounts or in glass mounts. (See also Filmstrip, Slidefilm, Picturol, Stillfilm.)

FILMSTRIP. A sequence of still pictures made on a continuous roll of thirty-five millimeter, non-inflammable film, in black and white or color, containing sprocket holes and projected by means of a special projector made for this type of film. Single frame filmstrips pass vertically through the projector; double frame filmstrips pass through horizontally. (See also Filmslide, Picturol, Slidefilm, Stillfilm.)

FILMSTRIP PROJECTOR. A machine especially designed for the projection of filmstrip material.

FLAT PICTURES. The usual term applied to all unprojected prints, drawings, sketches and photographs.

GLASS SLIDE. Designation for a lantern slide, either colored or black and white, made on glass, size 3¼ by 4 inches, to be used in a standard size lantern slide projector. (See Lantern Slide.)

GLOBE. A spherical body on whose surface is depicted a representation of the geography of the earth or heaven. When the representation is that of the earth's surface, the sphere is called a terrestrial globe. When the representation is that of heavenly bodies, the sphere is known as a celestial globe.

GRAPH. A diagrammatic representation of any sort of relationship by means of a system of dot and line markings.

GLOSSARY

GROUND GLASS. See Etched Glass.

HABITAT GROUP. The life-size, life-scale, three-dimensional group erected as a fixed part of the exhibits in a museum, for the purpose of displaying materials and specimens against a painted background which depicts, or is a composite approximating, an actual locality, and with accessories so arranged as to form an integral part of the group, usually artificially lighted. The true habitat group is a blending of accurate background, accessories and specimens so that it is a complete unit artistically, geographically, historically and biologically.

INTEGRATION. The "bringing together of parts into a whole"; used in connection with the various areas of the curriculum; as, the integration of these areas through audio-visual aids.

KIT. A collection of audio-visual teaching materials in a box or container. The materials included in this teaching kit are usually put together for a specific purpose, and to illustrate or to amplify a specific topic.

KODACHROME SLIDE. The trade name for the miniature lantern slide made on Eastman Kodak Company color film. (See Miniature Slide.)

LANTERN SLIDE. A picture made on glass, film or specially prepared material, and placed between glass or in a cardboard mount, and shown by means of a lantern slide projector. In the United States all standard lantern slides are made in size $3\frac{1}{4}$ by 4 inches. The slides must be so made that they can be placed in the carrier of the projector with the longer edges at the top and bottom. (See also Kodachrome Slide, Miniature Slide, Photographic Lantern Slide.)

MAP. A pictorial representation showing the extent and relative position of the geographical features of the world and conveying topographical or other information.

MAT. A thick paper or cardboard in or on which a picture is displayed. The term also refers to the surface of a picture or painting purposely made with a dull finish.

MINIATURE SLIDE. The 2 x 2 inch slide made by photographing directly on black and white or color 35 mm. film. The slide so made is mounted in a cardboard mount or between glass, and is shown by means of a projector made to accommodate this size slide. (See also Two by Two Lantern Slides.)

MODEL. A representation or replica of an actual object.

MOTION PICTURE FILM. The film on which is photographed a series of pictures or images later projected in the form known as motion pictures. There are three widths of film in use today, the 35 mm., the 16 mm., and the 8 mm. (See also Sound Film and Silent Film.)

MOTION PICTURE PROJECTOR. A machine especially designed for the projection of motion picture film. A machine of this type is made either for the projection of silent motion pictures or for sound motion pictures. Only silent film may be projected on a silent motion picture projector; a sound motion picture projector will project sound films and also silent film when the sound track switch is cut off.

MOUNT. The support, frame or background material upon which or by which anything is prepared and presented for use, exhibition or examination.

MULTI-SENSORY. That which appeals to two or more of the senses; sight, hearing, touch, feeling and smell.

NOMOGRAM. A study chart, diagram or outline, to which name or identification labels may be affixed. A type of training device.

OBJECT. In audio-visual instruction this term is used to mean

GLOSSARY

the real or actual thing as opposed to a representation, artificial reproduction or model.

OPAQUE PROJECTOR. A projection machine especially designed to enable one to project flat pictorial material in a manner similar to the projection of lantern slides. (See also Balopticon, Delineascope.)

OPAQUE SCREEN. The flat white-surface screen on which may be projected black and white or color silent motion pictures or lantern slides. The surface coating may be aluminum or the flat white, so-called "matte" coating which produces an even distribution of light.

ORIENTATION. The process through which a person goes to find his correct position in the group, community, or world.

PERSPECTIVE. The science which studies and explains how to paint or draw a scene so that objects in it have their right shapes and appearances. In the language of the artist, it is the making of objects seem far away or near to.

PHOTOGRAPHIC LANTERN SLIDE. A lantern slide in which the pictorial image is printed directly on the photographic lantern slide plate from a negative, processed, and then colored if desired. The slide so made is then covered with a cover glass, and projected as a standard lantern slide. (See also Lantern Slide, Miniature Slide.)

PICTUROL. The trade name for the continuous roll of 35 mm. film manufactured by the Society for Visual Education. (See also Film slide, Filmstrip, Stillfilm.)

PLAY-BACK. A phonograph or turn-table device on which records may be played.

PRINT. A positive picture or reproduction made from a negative. Applied in audio-visual instruction to pictures, photographs, and films.

PROJECTOR. A mechanical device for the reproduction or showing of a pictorial representation. (See also Motion Picture Projector, Filmstrip Projector, Opaque Projector, Stereopticon.)

REALIA. A general term applied to authentic material of any type. Applied in audio-visual instruction to that material which is real and authentic.

RECORD. A cylinder or disc plate prepared in such a way as to reproduce sounds when brought into contact with the needle of a phonograph or other recording apparatus.

RECORDING. The term applied to the mechanical account, evidence, record or report of a program of any kind.

REEL. A rotary spool or frame. The term for the unit of measurement applied to motion picture film. The standard reel of 16 mm. film for classroom use carries four hundred feet of film.

REPRESENTATIONAL. The term used in art to describe a picture in which the artist has depicted people and objects as close to reality as possible; photographic presentation rather than imaginative.

SCREEN. The surface on which a slide, motion picture or other pictorial image is projected and viewed. Screens for school use are of two general types—the opaque and the translucent. (See also Beaded Screen, Opaque Screen, Sound Screen, Translucent Screen.)

SILENT FILM. Motion picture film on which a series of pictures or images is photographed to be shown at a rate of sixteen frames per second. This film can only be shown on a projector geared to show silent film. (See also Motion Picture Film and Sound Film.)

SIXTEEN MILLIMETER FILM. The non-inflammable, acetate-base film which has become standard for classroom use. This film has forty frames to the foot and four hundred feet to the standard reel. 16 mm. silent film is projected at a rate of sixteen

GLOSSARY

frames per second; 16 mm. sound film is projected at a rate of twenty-four frames per second. (See also Eight Millimeter Film, Thirty-five Millimeter Film, Motion Picture Film, Silent Film, Sound Film.)

SLIDE CARRIER. That part of a lantern slide projector into which a slide is inserted for projection.

SLIDE VIEWER. An instrument or holder for the viewing of individual lantern slides. Usually a table-top instrument which gives sufficient magnification to permit close examination of the slide.

SLIDEFILM. A designation frequently used for filmstrip. (See also Filmslide, Filmstrip, Picturol, Stillfilm.)

SOUND FILM. Motion picture film with a band or "sound track" along one edge, produced either by sound waves recorded as the film is produced or added later as a recorded comment or musical accompaniment. This film is shown at a rate of twenty-four frames per second on a projector especially geared to record the sound track. (See also Eight Millimeter Film, Sixteen Millimeter Film, Thirty-five Millimeter Film, Motion Picture Film, Silent Film.)

SOUND SCREEN. A flat white opaque screen the surface of which is so perforated as to provide a surface acoustically adapted for use with sound motion pictures. (See also Beaded Screen, Screen, Opaque Screen, Translucent Screen.)

SOUND SLIDEFILM. A combination of filmstrip and disc records. Voice, music, or other sound effects are reproduced on disc records to accompany the filmstrip. Special projector units are available which contain both the projector for the filmstrip, a turntable for the record, and a built-in speaker.

SOUND TRACK. The narrow band which forms one edge of sound motion picture film. The varying amounts of light on this

band, when reaching the photoelectric cell of the projector, cause variations in current which in turn produce sound.

SPECIMEN. A single item or sample representative of a class or group of materials or things.

STANDARD LANTERN SLIDE. The $3\frac{1}{4}$ by 4 inch slide defined under "Lantern Slide." Known under this name, as these are the standard dimensions for lantern slides in the United States.

STEREOPTICON. A projection machine made especially for the projection of lantern slides. The name for a lantern slide projector.

STEREOGRAPH. An oblong picture containing two slightly dissimilar photographs of the same object, taken by a double camera with lenses set at a distance equal to the normal distance between the pupils of the eyes. The picture must be viewed through a stereoscope to obtain the correct pictorial effect.

STEREOSCOPE. A special optical apparatus or instrument used to view a stereograph.

STILLFILM. The trade name for the continuous roll of 35 mm. film manufactured by Stillfilm, Inc. (See also Film slide, Film strip, Picturol, Slidefilm.)

TEXTURE. The appeal to the sense of *touch*; used in connection with pictures as a part of the language of the artist.

THIRTY-FIVE MILLIMETER FILM. The standard width film used in motion picture theaters. It usually has a nitrate base and, as flammable material, must be projected in a fireproof booth, by a licensed operator. This film has sixteen frames to the foot and 1000 feet of film to a standard reel. 35 mm. sound film is projected at a rate of ninety feet per minute and the silent film at a rate of sixty feet per minute. (See also Eight Millimeter Film, Sixteen Millimeter Film, Motion Picture Film, Silent Film, Sound Film.)

GLOSSARY

TRANSLUCENT SCREEN. The screen of tracing cloth, etched glass or bleached muslin on which may be projected black and white or color silent motion pictures or lantern slides. It is particularly useful for "daylight projection" use in a partially darkened room. When in use this screen is placed between the projector and the group viewing the picture.

TRANSCRIPTION. An artificial record or recording of a "live" program.

TWO BY TWO INCH LANTERN SLIDE. This slide is made by photographing directly on black and white or color 35 mm. film. This slide so made is mounted in a cardboard mount or placed between glass, and is shown by means of a projector made to accommodate this size slide. (See also Miniature Slide.)

VECTOGRAPH. A special type of stereoscopic photograph, printed in two colors or in black and white. The two pictures must be printed on opposite sides of a polarizing film and viewed through polaroid glasses to obtain the three-dimensional effect they are designed to give.

VIEW-MASTER. A stereoscopic device whereby sets of stereoscopic miniature color photographs arranged on reels may be viewed as three-dimensional pictures.

VIEW-MASTER PROJECTOR. A two-dimensional projector especially designed for the use of interchangeable, seven-scene View-master picture reels.

